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FORMERLY

AMERICAN GAS LIGHT JOURNAL

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NEW YORK, SATURDAY, DECEMBER 8, 1917

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American
Gas Engineering Journal

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KOPPERS

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COKE AND GAS OVENS

The most efficient method of carbonizing coal is in KOPPERS OVENS and the best coke and by-products are produced by this process.

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FIG. 1—LOWER PART OF SETTING BEFORE PLACING POT IN POSITION

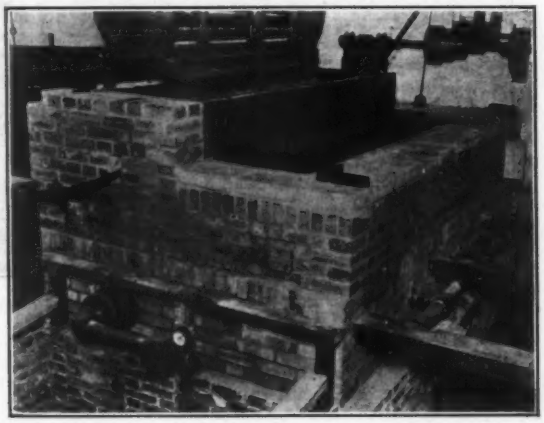

FIG. 2—POT IN PLACE WITH SETTING BRICKED UP AROUND IT

Advantage of Gas as a Fuel for Tin Plating Lies In the Relation of Proper Heat Application to the Making of a Perfect Product

Methods Employed in Plating — A Very Successful Gas-Fired Installation — Twenty Furnaces Using 525 B.t.u. Coke Oven Gas

By WILLIAM J. HARRIS, Jr.

Engineering Department, Surface Combustion Company, Long Island City, N. Y.

The methods used for coating steel or iron with tin or zinc have been, until recently, a closed book to all but the very few initiated. Now, however, most of the trade secrets have become quite generally known, and it is also possible to see plants in operation. An outline of the process of tinning steel sheets will be of value to show the relation that the proper application of heat bears to the making of a perfect product.

Heating Bath an Important Part of Process

The black sheets vary in thickness from about No. 26 to No. 33 gauge, and are generally about 20 x 28 in. in size. They are thoroughly "pickled" in dilute sulphuric acid to remove the scale and stored under water in portable steel tanks, from which they are taken as needed and fed into the tin bath. The heating of the bath is a very important part of the process, as a uniform temperature is essential for the turning out of a uniform product and continuous operation at a maximum rate. These conditions are easily obtained by the proper application of a gaseous fuel.

The accompanying illustrations show a very successful installation which utilizes coke oven gas having a heating value of about 525 B.t.u. per cubic foot.

Construction of Furnace

The furnace consists of a firebrick setting built around a rectangular cast-iron "pot" or bath of special design. The pot is about 9 ft. long x 4 ft. 10 in. wide, and holds about 11,000 lb. of tin when filled to the working depth of about 11 in. There is a longitudinal partition in the middle with a slot near the bottom which extends the full length of the pot.

The surface of the molten tin is covered on one side

FIG. 3—THE COMPLETE FURNACE IN OPERATION

of the partition with a flux of zinc chloride, through which the sheets are fed into the bath. The opposite compartment with higher sides contains palm oil, through which the sheets emerge from the bath, and gear-driven rolls which draw them through the tin as they are fed in by the operator.

Operating the Installation

Fig. 1 shows the lower part of the setting before placing the pot in position. The space to the right of the partition contains refractory beds, which are heated by a row of Surface Combustion burners of the impact type. This combustion chamber is under the part of the pot where the cold sheets are fed into the bath, and in natural operation these burners supply all the heat needed.

The outlet side of the bath is kept hot by the passage of the sheets through it. When the pot is being warmed up at the beginning of the week, however, it is necessary to apply heat to the outlet compartment. For this purpose a single large burner of the non-refractory bed type is provided at one end of the left-hand combustion chamber.

Burners Operate a High-Pressure System

All of the burners operate on the high-pressure system, with single-valve control and one-pipe distribution to the furnaces. The gas is supplied to the plant at a pressure of approximately 10 lb. per square inch, which eliminates all blowers and compressors.

Fig. 2 shows the pot in place, with the setting bricked up around it.

Fig. 3 is a view of the complete furnace in operation.

On actual test 7,850 lb. of steel sheets were coated at a temperature of 650 deg. Fahr. with 5,376 cu. ft. of 525 B.t.u. gas in eight hours, which is at the rate of 980 lb. with 672 cu. ft. of gas per hour.

Twenty-two furnaces of this design are now installed at the Baltimore Sheet & Tin Plate Plant of the Bethlehem Steel Company, Sparrows Point, Md. The burner equipment was supplied and the installation supervised by the Surface Combustion Company, Long Island City, N. Y.

English Gas Company Reports for First Half of Year Supply Data for Study of Existing Conditions and Determination of Probable Conditions After War

The Handicap of the Sliding Scale—Coal Supply and Labor Conditions More Settled—Psychology of Rate Increases—The After War Situation

By NORTON H. HUMPHRYS

The usual reports to gas company shareholders for the first half of the current year have been issued and considered at the meetings. More than usual interest attaches to the statements made by the several chairmen, which vary in tone according to the legal position, whether controlled by the sliding scale or the standard price, and to the extent of dependence on water-carried coal or other material. In many instances, the position of shareholders under the sliding scale deserves special sympathy, seeing that they are penalized by war conditions beyond their control, which were not considered in the terms of investment. A common experience is a dividend of less than 4 per cent on the face value, which means a much smaller return on the actual cash invested.

Favorably Situated Companies

The Government demands for shipping have so en-

croached on the general supply as to enable the extortion of enormous freightage rates. Previous to 1914, coal could be carried from Tyneside to London by sea for 70 to 82 cents per ton; to-day the rates asked for similar service are $2.90 or even $3.65. Large companies may own and run vessels, but they have either to face the risk of destruction under the enemy policy of "frightfulness," or the alternative of high marine insurance rates.

Companies that can obtain the whole of their supplies by rail, and work under standard price regulations, are for the most part able to maintain full statutory dividends. They can lift the selling price within the prescribed limits, and in few cases has the maximum been reached. But if for any reason the standard or the initial price is unusually low, the troubles incidental to the sliding scale are in some degree reproduced.

Coal supply (with the above exception) and labor conditions have now settled down on their bearings under the unprecedented war circumstances, and the worries attendant upon shortage of coal, delay in rail transit, the wholesale sweeping of laborers by the dozen, and the glut of tar are now things of the past. We are all feeling the lack of judgment during the earlier stages of the war in taking any physically qualified man for active service without appreciation of the fact that his special capabilities may render him a more useful asset to his country at home. In many instances one competent and experienced man is of more value than two or three raw substitutes.

Gas works accustomed to run with a coal plant not equal to the entire demand, and to depend on the carburetted water-gas plant for the deficiency, are hardly hit by the enormous price of gas oil, and inability to profit to the fullest extent by the high current prices for coke. As far as circumstances will allow they are extending the coal plant, usually by additions of modern systems of vertical retorts, which afford considerable advantage on the score of labor and for meeting the Government demand for tar.

Encroachments Upon Reserves Necessary to Make Dividends

As a rule, even the diminshed rates of profit have not been earned during the six months, and a dip into the reserves is necessary to make up a dividend. Advance of prices is therefore unavoidable, but in no case does this aproach the proportions attained by coal (which when the quality is considered is about 250 per cent), or of other important items of expenditure.

There has been too much hesitation about lifting the selling price of gas to an adequate extent. One can understand this when the rate of dividend is in jeopardy, but undertakings free from oppressive regulations are now more especially in view.

Hidebound by precedent, the increase has been 4 or 6 cents, when the circumstances warranted something nearer 20 or 24 cents per 1,000 cu. ft. It is a great error of judgment to lift the price in the absence of reasonable justification, but the fact that the converse is equally true is apt to be overlooked.

While the matter is in mind, a sensible forecast of the immediate future is as important as the mere tiding over of present deficiencies.

In the course of half a century's experience, I never heard of even a single instance of appreciation on the part of the consumer, in respect to reduced profits or depletion of reserves to the last shilling, and those who have drawn the correct line between precedent and excess are in sounder condition, and not without resource in the event of further trouble. More than that, they will be in a better position to meet the requirements of the position when peace is declared, and the first year or so after that much desired event will be a very trying time. There will be an immediate clamor for reduced prices, and with the resumption of normal lighting conditions, will come a large increase in the demand for gas.

All round arrears of repairs and renewals, from the retort house to the burners will claim prompt attention. New services and mains, and the demands of customers that have had to await better circumstances, both as to material and labor, will require immediate attention. Building operations, after some years stagnation, will be vigorously resumed, and much enterprise will be necessary to prevent the cause of gas from being prejudiced in the new work. Financial conditions will not right themselves in a day, new capital will not be easily acquired, and concerns with no reserves will suffer permanent injury.

Uniform Increase in Consumption

The most prominent feature is that, notwithstanding the numerous conditions that have tended to reduce consumption of gas, such as the cessation of outside lighting of every kind, including shop windows, licensing restrictions, daylight saving, and stagnation in the outside department, a phenomenal increase in output has been so general as to suggest that gas engineers have some reason for being grateful to the enemy air raiders.

If all had continued as usual, it would have been difficult to maintain a proper supply, with depleted labor and delay in extensions. The metropolitan gas companies average 10 per cent, as compared with the first six months of 1916. The suburban undertakings, comprising good class residential districts, are greater. The South Suburban reports 17; Wandsworth, 10; Barnet District, 14; North Middlesex, 10; Harrow & Stanmore, 16. and Lea Bridge, 17. Tottenham has just completed a large installation of verticals, equal to a make of 5,500,000 cu. ft. per day. In the provinces may be instanced Bournemouth, 14, and Colchester, 15.

High Pressure as a Means of Getting Better Returns from Investments in Mains

It is quite generally known by the gas fraternity that nearly all of the manufactured gas sold in this country is distributed through cast-iron mains with bowl joints made with Portland cement or lead. When natural gas made its appearance, one would naturally expect that the same kind of pipe would be used for its distribution, as the artificial gas men had shown no disposition to change during a period of sixty or seventy years. Under ordinary conditions the same kind of pipe would probably have been used for natural gas, but as the gas wells were owned by oil men, who were using wrought-iron pipe with threaded joints for transporting oil, they naturally decided to use the same kind of pipe for conveying gas to the towns and distributing the

same, stated J. S. Connelly in a paper presented at the recent Texas Gas Association convention. Some years later plain end couplings came into use. These were an improvement over threaded joints for high-pressure gas lines, and they in turn have been followed by the welded joint, which is undoubtedly the best for either high or low pressure.

High Pressure in Manufactured Gas Field

Until a few years ago the majority of the artificial gas companies were not carrying over 2 or 3 oz. pressure in their street lines, while the natural gas companies began with 8 oz. and over in their distributing system. It is well that they did so, as natural gas was selling for about one-eighth the average price of artificial gas, and it was very important and necessary for them to get as great a delivery capacity as possible, and the increased pressure mentioned gave them this advantage.

Many artificial gas companies are now using much higher pressure than formerly, and reducing to 3 or 4 oz. with individual regulators at the inlet of the consumers' meters. This has proved to be a great benefit to them, as it increased their delivery capacity and enabled them to derive a larger income in proportion to their investment in street mains.

There are indications that this plan of distribution by artificial gas companies will become more general in the near future.

An additional advantage is gained by distributing artificial gas under a high, or even a medium, pressure. Reference is here made to the removal of the moisture from the gas, thus doing away with water being formed in the mains by condensation and making it necessary to have drips in many parts of town which require pumping at frequent intervals.

Many are under the impression that it is not practical or even possible to distribute artificial gas under a medium pressure of several pounds, except in connection with high pressure storage holders; this is not the case, however, as a rotary booster is now on the market which will successfully and economically raise the pressure to any point not exceeding 10 lb., and will hold the same uniform, regardless of the variation in consumption.

Long Natural Gas Lines Not Profitable

Many of the long natural gas lines have not proven profitable, mainly for the reason that gas is a very bulky fuel in proportion to its heating value, and apparently this fact was not given sufficient consideration when some of the existing lines were projected.

Some idea can be formed of the relative bulk between oil and gas, each containing the same heating value, when we consider that one barrel of oil, which occupies a space of about 7 cu. ft., is equal in heat units to 4,000 cu. ft. of gas.

Even when we allow for the reduced bulk of the gas, when under high pressure in pipe lines, the difference is still enormous in favor of the oil, and explains why a much greater money value in oil can be put through a pipe line of a given size. It also explains why gas lines have much less earning power than oil lines.

I believe the following conclusions are among those which can be drawn from the points outlined in this paper:

When contemplating the laying of long pipe lines to convey natural gas, very careful estimates should be made of the money value of the gas, based on the prevailing rates to consumers that could be delivered through same, and what interest this sum would pay on the cost of the line (less depreciation and other expenses). I believe if this precaution had been more rigidly carried out in the past that fewer lines of this character would have been laid, and the money they cost would now be invested elsewhere and bringing much better returns. When planning artificial gas plants and distributing systems, careful consideration should be given to the advantage of medium and high-pressure distribution.

Effecting Economies in the Selection of Belts and Pulleys

In line with the advance of other materials, belting is holding up its end also, and it is more important than ever that we study belts and power transmission with the utmost care.

It is a well-known fact that a double belt, for instance, will not transmit twice as much power as will a single belt, even though it is twice as thick and twice as strong. The reason why is, a single belt has just as much contact with the pulley as has the double belt, and it is the contact that counts. Besides, the single belt is more flexible. It is also a well-known fact that double leather belts cost twice as much as single leather belts of equal width. In view of these facts, therefore, you will readily understand why single belts may often be the most economical selection, even though you may have to buy wider pulleys to accommodate the wider single belts.

I will just outline the manner in which belts and pulleys should be selected to effect the greatest economy:

First—Decide on the kind of belt you are going to use, whether leather or solid woven cotton belting, or other fabric material. The substitute belt is coming into very wide usage these days on account of the high cost of leather, and in some fields the substitute has completely ousted the leather belt. However, there is nothing better than leather for drives where shifters are used, because shifters are rather hard on fabric, tending to unravel the edges and giving the fabric a tattered appearance. On overhead or open drives, where there is no such cutting or wearing obstruction, the substitute belt does very well indeed.

Second—Determine the cost of a single belt or equivalent in the substitute belting for transmitting the power that must be carried. This is easily done by multiplying the horsepower to be transmitted by 800 and dividing by the speed of the belt in feet per minute. This gives the width of the belt in inches. Now consult your manufacturer's catalog and determine the cost of such a belt of the needed length.

Third—Determine the cost of the pulleys required for the single belt. The pulleys should be a bit wider, of course, than the belt, and they should be strong enough to withstand the load. It is a simple matter to find the cost in any pulley manufacturer's catalog.

Fourth—Add the cost of the belt to the cost of the pulleys and you have the cost of a "single belt drive."

Fifth—Determine the cost of a double belt or equivalent in the substitute belting field for transmitting the same amount of power as above. This is done by multiplying the horsepower to be transmitted by 500 and dividing by the speed of the belt in feet per minute. This gives the width of the belt in inches. Now consult your manufacturer's catalog and determine the

cost of such a belt of the same length as the single belt.

Sixth—Do the same as instructed under "Third."

Seventh—Add the cost of the double belt to the cost of the pulleys for the double belt, and you have the cost of a "double belt drive."

Eighth—Compare the cost of the "single belt drive" with the cost of the "double belt drive," and you can just about decide the question without any further ado. I have investigated cases where considerable money could have been saved by using single instead of double belts, and when it comes to using triple belts the saving is even more marked. In general the above method of computation will show the single belt drive to be the most economical, the double to come next, and so on. The thicker the belt the poorer the transmission power per dollar invested.

As for what thickness is best, we often read inflexible statements with reference to belts, that a double or triple belt must be used on such and such a drive. Statements of that kind are often far from the truth. I am not stating here what is best. I merely submit these data for your consideration and you may use your own judgment. I will add, in closing, that thick belts should never be used on small pulleys. The reason is obvious.

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Can Profit Sharing With Employees Be Successfully Worked Out?

R. H. Ballard Answers That It Can and It Will Improve Efficiency and Loyalty—Cites Prominent Cases Where It Has Been Worked

When our wage earners participate in the increment of their own labor human efficiency will approach its maximum. This principle is so fundamental, and its application so vital, that it must be worked out and fitted into any scheme of economics, which economic laws destine to become enduring, declared R. H. Ballard in a paper presented at the recent annual meeting of the Pacific Coast Gas Association. It is based on a principle which has actuated and accelerated individual endeavor since and wherever hire has supplanted feudalism and serfdom, and the instinct of individual thrift was given a chance to form its sphere in the field of opportunity.

While "profit-sharing" is a term that latter-day conditions have injected into our vocabulary, the theory can be found on the tablets of the Mosaic law, and its working out through the progress of the years, striking from slave and vassal their bonds, evolving the wage earner, and from the wage earner the great middle class of Europe, which class, transplanted to America, has made us a nation of business men.

Three Factors in Utility Field

With transportation companies, which are under regulation by the Interstate Commerce Commission, and public service corporations, which are regulated by some regulating body in the State in which they operate, the wages paid employees, the salaries paid officers, and the dividends paid stockholders, which is simply another term for wages for the work of their money, are the three factors into which profit-sharing should enter as a part of the business. Increase in efficiency should bring substantial recognition to the officer who plans to make the property and the operating force produce the highest results; to the employee who, with hand and brain, does his part to help achieve the same result, and to the stockholder whose money is represented in the property—which is the machine at which both officers and employees work.

In some of the States the regulating bodies recognize efficiency in operation, and provide that its results can be shared by officers, employees and stockholders. The California State Railroad Commission has stated this to be its policy, but it has not yet formulated it into a ruling.

It has only been under our new conditions, in which centralization is the dominant factor, that profit-sharing demands have been formulated on definite and equitable lines. The problem is a large one, a far-reaching one, and its wise solution will exercise a wholesome and permanent influence upon our political, industrial and domestic well-being. It will be worked out; it is being worked out, for some of the best and most constructive minds of our generation are generously devoting their energies to the task. It is in this, as in all problems where constructive genius and practical initiative are required, the minds that guide greatest corporate institutions are foremost in deriving practical results.

Endeavoring to give the study of my subject as broad a scope as practical for condensive treatment, I have selected for concrete discussion the profit-sharing plans of the United States Steel Corporation, the American Telephone & Telegraph Company, and the Harris Trust & Savings Bank, of Chicago. Differing as these do, they have the same aim, and having been formulated and made operative by experienced and conservative financiers, their working has proved sufficiently satisfactory to warrant their being taken, in whole or in part, as the basis of plans having the same objective.

Plan of the Steel Corporation

Let us examine the profit-sharing plan of the United States Steel Corporation, one of the greatest of our unregulated corporations, which established a stock-subscription plan in 1903, the principal features of which are:

Subscriptions depend on salary, but are relatively greater for the low-paid workmen.

Stock is offered at market price, or a little less.

Minimum monthly payments are $1.25 to $1.50 per share for common and $2 to $3 per share for preferred, varying each year in accordance with the price of the stock.

Maximum payments are limited to 25 per cent of monthly earnings.

Non-paid up subscriptions may be cancelled and the money paid in refunded to employees with 5 per cent interest.

Until payment of subscription has been completed, dividends are credited to the account of subscriber as part of his payment.

As an inducement for employees to keep their stock, special benefits are offered in the way of premiums on stock, subject to certain restrictions.

While the full report of subscriptions for this year are not available at the time I secured my data, it indicates that some 40,000 employees will have subscribed for some 68,000 shares of stock.

With individual employers, firms or commercial corporations, the problem is far more simple and offers

latitude for the sharing of profits in ratio to the profits of the business or in any way that the owners may provide, even to the point of philanthropy.

The American Telephone & Telegraph Company, which is a regulated corporation, has a plan for securing a distribution of stock among its employees, which is termed a "Plan to aid employees of Bell System to become stockholders of American Telephone & Telegraph Company." The summarized statement of the company shows that 48,192 employees have contracted for 150,572 shares of stock, an average of 3.12 shares each. During the two years since the plan was announced about 11 per cent of the shares contracted for have been surrendered for one reason or another. Some of these were on account of death; some by employees leaving the service, and by some who found themselves financially unable to carry out their contracts. Employees now have the right to pay the balance due on their contracts for the purchase of stock and to withdraw their stock from the trustees who have held it since they contracted to purchase it. For this reason no more surrenders are expected. Some of the outstanding features of this plan are:

Employees receiving $300 or less per annum are limited to one share.

Maximum subscription is ten shares—to employees receiving $2,700 or more per annum.

Subscriptions call for monthly payments of $2 per share.

Provision is made for cancellation of subscription and refund of all money paid in should employee leave the service or in case of death. After May 1, 1918, however, option will be given to such employee or legal representative of the deceased to pay up unpaid balance and take the stock.

A Firm Which Contributes to Fund Out of Earnings

The "Employees' Savings and Profit-Sharing Fund" of the Harris Trust & Savings Bank, of Chicago, differs in many respects from the plans discussed, and has among its features the following:

All officers and employees who have been in the employ of the bank for at least three years are obliged to participate in the fund, but those who have not been employed for that period are not permitted to participate. Officers and employees, qualified by the three years' service, are obliged to contribute not less than 2 per cent and may contribute not more than 5 per cent of their salaries. The bank pays over to the fund 10 per cent of its total annual net earnings, this contribution being based upon its net earnings available for division, as determined by the directors of the bank. These payments are made semi-annually. All payments by employees are placed to their credit, and to this credit is added pro rata the amount contributed by the bank, in proportion to the respective sums contributed to the fund for the same period for which the bank's contribution is made, and any income or profit from the fund is also credited pro rata in proportion to their respective interests. The management of the fund is entrusted to five trustees, consisting of three officers of the bank and two employees. The trustees treat the contributions made by the bank and the employees as one fund for the purpose of investment and reinvestment and sale and resale. The privilege of contributing to the fund applies only as long as the employee is in the actual service of the bank. No officer or employee is permitted to withdraw any part of his interest in the fund so long as he is in the employ of the bank, but in the absolute discretion of the trustees a loan can be made in cases of necessity, but the borrower does not participate in the contributions made by the bank until the loan is paid and his regular contribution is applied to the liquidation of the indebtedness. The plan is well worked out in detail, covering death, retirement and other contingencies.

Reasons for Profit-Sharing Plans

In passing to this constructive phase of the problem, it may not be amiss for us to briefly consider the reasons which have led up to the widespread and active interest of profit-sharing plans. The events which have culminated in the desirability for private capital to arrange a basis upon which those employed by it may participate in its earnings are analogous to the commercial and industrial growth and increased population of the United States.

Contrasting the opportunities of the inhabitants of our sparsely peopled thirteen original States with our ocean-to-ocean population of to-day, we find the reason why profit-sharing is a vital problem. Emerging from the colonial government, under our federal constitution opportunity called lustily to every man who would wield an ax or hold a plow to share in the wealth of the rich and undeveloped domain that stretched westward to what was then considered the remote Mississippi, and our Pacific Empire was not even the figment of a dream. Capital was almost a negligible requirement for a man to become an agriculturist; the thrifty savings of a few years was ample capital to embark in mercantile enterprises, and manufacturing, such as our textile and shoe industries, required little more equipment than the loom and last.

We have but to focus on these days and glance at the progress of the succeeding years to grasp the changes which have been wrought in less than a century and a half by big machinery, quick transportation and thorough distribution. These are the chief factors in accelerating the working out of the economic law of centralization. In about the same proportion that centralization has advanced, the requirement of capital to engage in business has increased, and as the amount of capital has increased the opportunity for the wage earner to become a business man has decreased. To illustrate: The time is not far past when a merchant's clerk, with a small accumulation of savings, could buy into his employer's business or start for himself in some new community. To-day those opportunities are very rare. A thrifty farm hand was, not long ago, in a position to become an independent agriculturist with the possession of a team of horses and a few implements. To-day he would have to compete with a tractor. Out of the small individual businesses have arisen industries that are for many reasons finding it advantageous to incorporate.

With opportunity for the employee to engage in business constantly narrowing, with a desire to retain the services of skilled and faithful employees, and associate their experience and knowledge with the business, employers in various branches of commerce have been for some years past working out profit-sharing plans which have enabled thousands of employees to participate in

the profits of the industry in which they earn their wages.

Gas Company Takes Initiative Step

With the great corporations of the country, with their billions of investment and their army of employees, the problem of profit-sharing is much more intricate and far-reaching than with an automobile factory or a department store, and it has been approached with the conservatism, caution and method characteristic of those accustomed to dealing with colossal affairs.

The Pacific Gas & Electric Company, of San Francisco, and the Southern California Edison Company, of Los Angeles, have taken the initiative step in profit-sharing with their employees to the extent of permitting them to purchase stock on such easy payments that all can become stockholders and profit-sharers. When efficiency is substantially recognized by the State railroad commission, the incentive to stockholding employees will be doubled—by doing their best for the company they will make its dividends larger and they will share in them—a portion of the savings will go onto the payroll and they will share in that.

Without assuming a paternal relation to employees, it can be regarded in a sense as a duty and a privilege of the officers of the corporation to help inculcate thrift. To whom should the thrifty employee turn for advice and assistance in saving and investing his earnings but the officers of his company. He knows them and has confidence in them. Their knowledge and experience is directed to making money for the stockholders. It is most natural that they should take a deep and kindly interest in seeing the employees with whom they come in daily contact accumulate and profit in the stock of the company.

It will be a condition of mutual felicity when employees and officers of our public service corporations are partners. It cannot fail to improve the efficiency and loyalty, for "where the treasure is, there shall the heart be also."

New Process for Sulphur Removal Restores Oxide and Provides Another By-Product

In coal-gas plants where the process of manufacture produces considerable quantities of cyanides there is a market for the spent oxide for the use of prussiate makers, but where the cyanide content is low, or, in the case of spent oxide from water-gas plants, there has been little or no sale except in unusual cases where the sulphur content is exceptionally high and favorably located sulphuric acid works can burn the whole mass.

There has recently been developed a process for handling spent oxide, for which there is no market, which makes possible both a profit and a saving. This is the Given Process of sulphur extraction, which removes the sulphur and the tar from the spent oxide in such form that the sulphur can be sold to acid makers, and which leaves the oxide in condition to be used again for its original purpose.

In this process the sulphur is extracted by repeated treatments with carbon bi-sulphide, which is continually distilled off from the sulphur solution and returned to use, and finally completely driven off and collected, both from the sulphur mass and from the oxide. The sulphur is then heated until melted, run out into boxes to cool, broken up and shipped. The sulphur free oxide is removed from the extractor in a moist condition, and when sufficiently dried out is returned to the filter boxes for re-use.

Similar processes have been tried in England and in Germany, but have not been successful for two reasons: First, the lack of knowledge of or inability to obtain the proper kind of valves for use on such an apparatus, with a consequent large loss of solvent; and, second, the inability to sell at a profit the crude sulphur produced. Also, there seems to have been no attempt to use the oxide over again.

In the Given Process the first problem has been solved, as is proved by the fact that the loss of solvent, even in the first batches run, is under 2 per cent. As regards the second, the sulphur from a plant now in operation is being sold at an attractive profit to acid works, who pronounce it excellent for their use.

Samples of the recovered oxide from this plant have been submitted to two large gas works, both of whom report that it is practically as good as fresh oxide. The same result is reported by an independent worker who has experimented on the removal of sulphur by another means. At the present time, with the high cost of chemicals and the difficulties of transportation, the saving of oxide is in itself a considerable item; and the price of sulphur, because of shortage in supply, makes that product highly vendible. The process is simple in operation and shows a favorable return on the necessary investment.

How the Gas Companies are Helping the Nation

The Independence Gas Company, serving Independence, Iowa, subscribed an aggregate of $1,000 to Liberty Bonds and $100 to the Red Cross.

The Central Illinois Light Company, at Peoria, Ill., has a unique distinction in that nearly every employee wears the Liberty Loan button, the Red Cross button and the Y. M. C. A. button. It also has employees in nearly every branch of the service. S. B. Sherman is superintendent of gas works.

The Public Service Company of Northern Illinois and Samuel Insull, head of the concern, each gave $2,500 toward the recent campaign for a $35,000,000 Y. M. C. A. soldier fund.

The Public Service Gas Company of Nen Jersey has a service flag bearing the numerals 688 made out of stars flying over the Public Service Terminal Building in Newark. This figure represents the number of employees now in the military and naval service. The company subscribed $100,000 to the second Liberty Loan; officers $127,900 and employees $162,950, making a total of $390,850.

In the November issue of *Service,* which is published by the company, there appears a list of the men in active service, which includes the following employees' names:

Everett A. Dunn, Stenographer, Gas	Private, Medical Corps, American War Hospital
Ross O. Fowler, Traveling Auditor, Gas	First Lieutenant, Officers' Reserve Corps
K. J. Grapel, Clerk, Gas	Seaman, U. S. Naval Reserve, Third Dist.
Ernest C. Hegeler, Stenographer, Gas	Second Lieutenant, Officers' Reserve Corps
Henry E. Jones, Bookkeeper, Gas	First-Class Yeoman, U. S. Naval Reserve
W. R. C. MacFayden, Clerk, Gas & Elec	U. S. Navy
Jack C. Richer, Stenographer, Gas & Elec	Clerk, Bureau of Chemistry, War Dept., Washington, D. C.
Paul A. Waters, Gen. Bookkeeper Auditing Dept., Gas & Elec	Officers' Reserve Corps, Fort Myer, Va.
T. R. White, Cadet, Gas & Elec	Officers Reserve Corps
W. T. Gilsman, Collector, Gas & Elec	Seaman, U. S. Navy, Newport, R. I.
T. A. Leary, Maintenance Man, Gas	Private, Company F, 5th Regiment, N. J., Anniston, Ala.
John C. Rothe, Collector, Gas & Elec	Seaman, U. S. Navy, Newport, R. I.
Frank J. Smith, Salesman, Gas	Corporal, Company F, 5th Regiment, N. J., Anniston, Ala.
J. W. Valentine, Bookkeeper, Gas	Private, 1st Regiment, Anniston, Ala.
William J. Fitzpatrick, Salesman, Gas	Private, Company B, 6th U. S. Engineers, Washington
W. F. Nally, Stenographer, Gas & Elec	Private, Company L, 5th Regiment N. J., Anniston, Ala.
William P. O'Niell, Clerk, Gas & Elec	Sergeant, Company G, 5th Regiment N. J., Anniston, Ala.
Ernest Cullen Roberts, Stenographer, Gas & Elec	Second-Class Yeoman, U. S. Naval Reserve
Daniel P. Casey, Salesman, Gas	Fireman, U. S. S. Vivance
Owen K. Swain, Cashier, Gas & Elec	Second-Class Seaman, U. S. S. George Washington
John R. Hamilton, Stenographer, Gas & Elec	Second-Class Seaman, U. S. S. Margaret, S. P. No. 527, N. Y. C.
Paul H. Woyke, Order Clerk, Gas & Elec	Private, Company B, 57th Infantry, Leon Springs, Texas
W. E. Boone, Junior Clerk, Gas	Corporal, 165th Infantry, Rainbow Division, Mineola, L. I.
Robert W. Haver, Collector, Gas & Elec	Private, 308th Field Battalion, Signal Corps, Fort Lee, Va.
L. F. Poling, Collector, Gas & Elec	Private, Quartermaster's Dept., Syracuse, N. Y.
C. D. Schiffman, Cadet Engineer	Private, Company B, 22d Regiment, N. Y. Engineers
L. E. Starker, Asst. Chief Clerk, Gas & Elec	Private, Troop D, 1st Squadron Cavalry
F. J. Dunning, Maintenance Man, Gas	Private, Cavalry
Royal E. Haight, Maintenance Man, Gas	Corporal, Machine Gun Company
W. H. Schneiderwind, Maintenance Man, Gas	Private, Battery E, 1st Regiment N. J.
E. H. Gossington, Ledger Clerk, Gas	Private, Battery A, 1st Regiment N. J.
J. C. Hoatson, Salesman, Gas & Elec	Social Secretary, International Y. M. C. A.
John E. Sellick, Stenographer, Gas & Elec	Corporal, Artillery
Leo Sinsheimer, Maintenance Man, Gas	Corporal, Artillery
Leo Thompson, Stenographer, Gas	Private, British Medical Corps
Paul J. Zingg, Stock Clerk, Gas & Elec	Musician, 1st Field Artillery
H. W. Auringer, Clerk, Gas	Apprentice Seaman
Arthur Beechel, Clerk (Dist'n)	National Army, Camp Dix, Wrightstown, N. J.
Joseph Bitz, Clerk (Dist'n)	National Army, Camp Dix, Wrightstown, N. J.
Leo Brady, Clerk (Shop)	Battery E, N. J.
E. R. Brown, Representative, Gas	Trumpeter, Coast Artillery
W. F. Campbell, Representative, Gas	Aviation Corps
J. Carberry, Holderman	U. S. Navy
F. U. Conard, Cadet Engineer	First Lieutenant, Officers' Reserve Corps
W. S. R. Dickinson, Clerk, Gas & Elec	Third-Class Yeoman, U. S. Navy
A. E. Gensch, Clerk, Gas & Elec	Private, Engineer Corps
G. Gorski, Gas Maker	National Army, Camp Dix, Wrightstown, N. J.
J. A. Halsall, Clerk, Gas	Private, Medical Corps
Stanley Held, Cadet Engineer	Battery A, 2d N. J. Field Artillery
L. C. F. Horle, Industrial Fuel Repr., Gas	Radio Electrician, Radio Laboratory, Washington
H. Ludwig, Engineer	U. S. Navy
David Morgan, Collector, Gas	Private, Battery A, N. J. Field Artillery
Thomas J. Reilly, Clerk (Dist'n)	National Army, Camp Dix, Wrightstown, N. J.
R. R. Urwin, Clerk, Gas & Elec	Apprentice Seaman, U. S. Navy
J. A. Wallace, Representative, Gas	Chief Clerk of Stores, U. S. A. Transport Ship Tenadores
Joseph M. Brown, Collector, Gas	Sergeant, Company I, 5th Regiment N. J.
E. Jones, Maintenance Man, Gas	Aviation Corps
E. Saxon, Maintenance Man, Gas	Aviation Corps
C. P. Rex, Salesman, Gas	Private, Ambulance Corps, 33d Regiment
G. G. Tuck, Salesman, Gas	Private, Company K, 12th Regiment, N. Y.
F. J. Kilduff, Collector, Gas	Private, Coast Artillery
E. G. Hughes, Ledger Clerk, Gas	Corporal, Company D, 7th Regiment N. Y.
James McGloin, Gasmaker	Private, U. S. Army
W. C. Nestler, Ledger Clerk, Gas	First-Class Apprentice, Naval Hospital, Brooklyn Navy Yard
Martin J. White, Cadet Engineer	Officers' Reserve Corps, Fort Myer, Va.
J. A. Bush, Bookkeeper, Gas	National Army, Camp Dix, Wrightstown, N. J.
Harry Bowne, Bookkeeper, Gas	Sergeant, U. S. Field Artillery
William M. Fanning, Clerk, Gas	Sergeant, Machine Gun Company, 5th Regiment N. J.
Milton Gamberton, Home Maintenance, Gas	Private, U. S. Infantry
Arthur Wachter, Cir. Clerk, Gas	Yeoman, N. T. S., U. S. Navy
H. C. Boozer, Steno. & Clerk, Gas	Company Clerk, Anniston, Ala.
J. Haas, Representative, Gas	Seaman, Naval Coast Defense, Cape May, N. J.
H. C. Woolman, Sundry Sales Clerk, Gas	Sergeant of Supply Company, Anniston, Ala.
H. H. Brannin, Clerk	Private, Medical Corps
Paul Chambers, Stenographer, Gas	Corporal, 3d Pennsylvania Infantry
George W. Hoffman, Clerk	Aviation Signal Corps
Paul Stuart King, Clerk	Aviation Signal Corps

J. A. Mayer, Clerk, Gas.....Second-Class Seaman, U. S. Naval Coast Defense
J. H. Todd, Bookkeeper, Gas.....Sergeant, 1st Pennsylvania Infantry
S. E. Duffield, Bookkeeper, Gas.....Private, U. S. Army
B. S. Newman, Representative, Gas.....First Sergeant, Machine Gun Company
G. F. Prieth, Gas Appliance Salesman, Gas.....Private, Company C, 1st Battalion
C. A. Runyon, Collector, Gas.....Private, Company E, 2d Regiment N. J.

H. M. Byllesby, at the request of the War Department, has accepted a commission as major in the aviation department of the United States Signal Corps. He will be executive officer of the Personnel Section in charge of recruiting the large number of fliers and mechanics needed for aviation service. His headquarters will be in Washington, but as his duties will require traveling, he expects to visit Chicago frequently.

Although Mr. Byllesby has been active in civilian war work in various capacities, the summons from the Government was unexpected. He promptly accepted when the urgency of the situation was explained by the War Department.

As an organizer and presiding officer of patriotic meetings in Chicago, as a speaker in the Liberty Loan campaigns in Illinois and Wisconsin, and as a member of the executive committee of the Chicago Chapter of the Red Cross, Mr. Byllesby's patriotic efforts are well known. He is also chairman of the Chicago Branch of the National Security League, member of the executive committee and one of the organizers of the Universal Military Training League, chairman of the Allied Committee for recruiting in Chicago, a member of a committee of the National Defense Council and an active worker for the Navy League.

An an engineer he has participated both in the perfection and the manufacture of electrical apparatus and the construction of gas hydroelectric and steam power plants. Since January, 1902, Mr. Byllesby has been the president of the company bearing his name, which has been prominent in the financing, designing, construction, operation and management of electric light and power, gas and street railway properties, these properties now serving about 2,000,000 people in upwards of 350 communities in sixteen States.

The Charles City Gas Company, serving a population of approximately 7,000 at Charles City, Iowa, subscribed $200 to the Liberty Loan, $50 to the Red Cross and $50 to the Y. M. C. A. Three of the company's employees are liable to draft. R. K. Runner is manager of the company.

The Springfield Gas & Electric Company, of Springfield, Ill., at their recent directors meeting, voted to loan the services of their secretary, E. L. Maxwell, to the Red Cross Society for several months. Ralph Covert, of Jackson, Mich., was elected assistant secretary to fill Mr. Maxwell's place until his return.

J. Russell Snyder, who left the employ of the United Gas Improvement Company at the Norristown, Pa., plant to become a first lieutenant in the Signal Corps, U. S. Reserves, is at present located at Camp Lee, Virginia, with the 305th Field Signal Battalion.

W. L. Beckham, storekeeper for the Texas Power & Light Company, of Brownwood, Texas, has volunteered for military service and is now at Camp Bowie, Fort Worth, Texas.

The Old Colony Gas Company, of East Braintree, Mass., has given the following employees to the service of the nation:

Abraham Mansker, Sergeant, U. S. Medical Corps, Fort Slocum, New York.
John F. O'Connor, 302d Infantry, Camp Devens, Mass.
Fred. L. Gritman, Aviation Corps, U. S. Army, New York, N. Y.
Fred. Ward, Lieutenant, Quartermaster's Department, Camp Devens, Mass.
Ernest M. Vaughan, Ensign, U. S. N. R., U. S. Navy.
D. F. Condrick, Pay Clerk, U. S. Navy, Brooklyn, N. Y.
L. W. Griffin, Private, Machine Gun Company, 104th Regiment, 52d Brigade, U. S. Infantry, Am. Exp. Forces.

The Journal is indebted to C. D. Bond, special representative of the company, for the foregoing information.

The United Gas Improvement Company, of Philadelphia, have included on their Honor Roll, in addition to those mentioned in previous issues as being in active service, the following employees from the commercial department:

Frank M. Adams.....Battery F, 2nd Pa. Artillery
Winfield S. Barr.....Company A, 3rd N. J. Infantry
Wallace H. Bender.....Camp Meade
Stanley H. Berry.....U. S. Cavalry
Harry Brooks .....U. S. Marine Corps

Harry S. Brough.....U. S. Marine Corps
A. B. Campbell, Jr.....Naval Reserve Force
John F. Carr, 3rd.....Battery F, 2nd Pa. Artillery
Edwin Channing .....U. S. Radio Corps
Henry Coffin, 3rd.....U. S. Aviation Corps

John M. A. Cox.....Naval Reserve Force
Harry C. Dalton.....Camp Meade
Thomas Ecker.....Navy, Musician
Joseph Emsley.....U. S. Navy
James H. Ferguson.....Battery F, 2nd Pa. Artillery

Lawrence F. Fithian....Battery F, 2nd Pa. Artillery
Carroll A. Getzinger....Headquarters Co., 3rd N. J. Infantry
Paul R. Hanley.....Camp Meade
Raymond Heritage .....U. S. Cavalry
William H. Johnson....Camp Meade

Charles M. Kelly.....Camp Meade
Charles E. McClellan...Camp Meade
Leo F. McDonald.....Naval Coast Defense Reserve Force
G. C. Pearce.....Camp Meade
Edward Pilkington .....U. S. Cavalry

Howard Rennie .....Camp Meade
Charles E. Rickards....Camp Meade
Charles Seeman .....Company E, 1st Pa. Engineers
Charles E. Sheetz.....Camp Meade
R. Otto Sigesbe.....Quartermaster's Reserve Corps

Richard E. Singer.....City Troop, 1st Pa. Cavalry
Frank W. Stubbin.....Coast Artillery
Harry A. Weber.....Camp Meade
Charles E. Wiley.....Battery F, 2nd Pa. Artillery
Leroy J. Woodhead....Naval Coast Defense Reserve Force

E. M. BARBER, who was in the employ of the Coal Products Manufacturing Company, of Joliet, Ill., as cadet engineer, recently left to commence his training for a commission in the aviation department of the Signal Corps. He will commence his ground school work at the training camp at Ithaca, N. Y.

RICHARD J. AMBLER, youngest son of T. M. Ambler, commercial manager of the Brooklyn Union Gas Company, has just received his commission as second lieutenant at Plattsburg Training Camp, and will report at Camp Mead on Dec. 15 for duty.

JOHN T. NAYLON, formerly with the Detroit City Gas Company, Detroit, Mich., as industrial salesman, took the officers' training course at Fort Sheridan, and is now second lieutenant in the ordnance department at Washington.

THE BROOKLYN UNION GAS COMPANY and subsidiary companies held the annual cabaret and ball of the Progress Club on Friday evening, Nov. 23, at Arcadia Hall, Halsey Street and Broadway. The proceeds, about $1,500, will purchase comfort kits and other articles for 172 gas company employees now serving. A service flag, with 172 stars, was raised by Mae Schneider, attired as "Miss Liberty," just before the grand march, which was led by Mr. and Mrs. Thomas F. Whitty.

The entertainment committee in charge of the cabaret which preceded the dancing was made up of Edgar L. Shultz, George J. Heinz, Otto J. Aumuller, Lorenzo G. Tomaselli and Francis J. O'Brien.

THE COAL PRODUCTS MANUFACTURING COMPANY, of Joliet, Ill., employees have responded to the nation's call, and the following men are in active service:

J. Hess	Aviation
R. Reimer	Coast Artillery
M. Metz	Infantry
J. Metz	Infantry
H. Ostrey	National Army

In addition to these men, E. M. Barber is in training, a note of which is made elsewhere in this issue. A. H. Harris, Jr., is superintendent of the company.

THE DERBY GAS COMPANY, of Derby, Conn., recently hung a service flag with five stars in front of their office on Elizabeth Street. The flag was put out in recognition of the five employees of the company who have entered in the Government's service.

THE PEOPLES GAS & ELECTRIC COMPANY, at Mason City, Iowa, subscribed $5,000 to the Liberty Loan and donated $500 to the Red Cross. The employees also did their share by subscribing $1,450 to the Liberty Loan. The company's Honor Roll of the employees in active service consist of the following: L. A. White, Paul Berner, Edward Berlin, Herman Rastedt and E. R. Dull. W. W. Schwarting is general superintendent of the company.

THE SPRAGUE METER COMPANY, manufacturers of cast-iron gas meters of Bridgeport, Conn., employees subscribed $10,300 to the second Liberty Loan campaign.

Net Decrease in Petroleum Reserves in Nine Months of 1917, 6 Per Cent of Reserves on Hand Jan. 1

The following table prepared by John D. Northrop, of the U. S. Geological Survey, shows, by months, the quantity of crude petroleum marketed, consumed and in stock in the United States since the beginning of 1916.

CRUDE PETROLEUM MARKETED, CONSUMED AND HELD IN STOCK IN THE UNITED STATES FROM JANUARY, 1916, TO SEPTEMBER, 1917, INCLUSIVE, IN BARRELS OF 42 GAL. EACH

1916 Month	Quantity marketed	Apparent consumption	Stocks at end of month
Dec. 31, 1915	.....	.....	185,899,792
January	23,181,022	21,115,549	187,965,265
February	22,733,550	21,126,277	189,572,538
March	25,523,666	25,755,303	189,340,901
April	24,024,447	24,804,985	188,560,563
May	26,015,713	25,418,752	189,157,324
June	25,539,611	26,563,582	188,133,353
July	25,379,700	24,229,287	189,283,766
August	25,206,566	28,328,130	186,162,202
September	25,261,174	28,750,037	182,673,339
October	26,747,529	28,215,247	181,005,621
November	25,301,138	28,438,809	177,867,950
December	25,853,042	29,692,641	174,028,351
Total 12 months	300,767,158	312,438,599	174,028,351
Total 9 months	222,865,449	226,091,902	182,673,339

1917 Month	Quantity marketed	Apparent consumption	Stocks at end of month
January	27,431,000	28,056,000	173,403,000
February	24,399,000	24,899,000	172,903,000
March	28,448,000	29,338,000	172,013,000
April	27,628,000	27,996,000	171,644,000
May	28,201,000	29,238,000	170,606,000
June	27,927,000	29,034,000	169,498,000
July	29,528,000	31,050,000	167,977,000
August	30,457,000	32,804,000	165,631,000
September	30,275,000	31,657,000	164,249,000
Total 9 months	254,249,000	264,072,000	164,249,000

These data indicate an increase of 14 per cent in the quantity of petroleum marketed in the first nine months of 1917 compared with that marketed during the first nine months of 1916 and of nearly 17 per cent in the quantity apparently consumed during the same period.

The net decrease in stocks during the first nine months of 1916 was 3,226,453 barrels, or about 2 per cent of the reserve on hand Jan. 1, 1916.

The net decrease in stocks during the first nine months of 1917 was 9,779,000 barrels, or about 6 per cent of the reserve on hand Jan. 1, 1917, and about 5 per cent of the reserve on hand Jan. 1, 1916. The average daily draft on stocks in September, 1917, was 44,550 barrels, and the average for the first nine months of that year was about 36,000 barrels.

Boston Output Report Shows Increase

The gas output of the Boston Consolidated Gas Company for November was 555,000,000 cu. ft., or 5.8 per cent more than that for November last year. The October output was 545,424,000 cu. ft.

Patents Pertinent to Gas Industry

Hydrogen Produced by Messerschmitt Process

Patents Nos. 1,225, (262, 263, and 264); described in Patent Office *Gazette*, May 8, 1917, page 449. Anton Messerschmitt, Stolberg, Germany. Original application filed June 26, 1912. Serial No. 706,118. Divided and this application filed Jan. 9, 1915. Serial No. 1,444. (Cl. 48-198.)

This is the patent for the Messerschmitt process of producing hydrogen. An iron charge in an externally heated vessel is alternately oxidized by means of steam, and reduced by a current of reducing gas. These reaction currents and the liberated hydrogen on their way to and from the vessel flow through heated spaces in which heat at high temperature is stored. Between these alternating oxidizing and reducing stages a heating stage is interpolated as required to maintain the temperature of the heating spaces.

Method of Producing Carbon Monoxide Gas

Patent No. 1,225,396; described in Patent Office *Gazette*, May 8, 1917, page 497. George Hillard Benjamin, New York, N. Y. Filed June 7, 1911. Serial No. 631,762. (Cl. 48-65.)

This process consists in creating a zone of high temperature in the coal in a producer through the action of highly heated waste furnace gases and air, thereby forming carbon dioxide. This latter gas is subjected to the high temperature effects of an electric current between electrodes so placed as to use the coal as a resistance medium whereby the carbon dioxide is disassociated and combined with carbon to form carbon monoxide.

Breathing Apparatus Designed for Use in Noxious Cases

Patent No. 1,225,269; described in Patent Office *Gazette*, May 8, 1917, page 451. James W. Paul and Clarence Hall, Pittsburgh, Pa., said Paul assignor to said Hall. Filed July 10, 1916. Serial No. 108,335. (Cl. 128-13.)

This apparatus consists of a main breathing bag, having a secondary bag within it, and an oxygen supply connected to the latter bag. A valved connection is placed between the two bags, the pressure between the two being automatically controlled. The main bag is supplied with inlet and outlet connections, an absorber being connected to the inlet of the main bag and a mouthpiece connected with the outlet of the main bag and with the absorber.

Distillation Process Carried on by Counter Current Contact With Heat Carrying Medium

Patent No 1,225,226; described in Patent Office *Gazette*, May 8, 1917, page 437. Henry L. Doherty, New York, N. Y. Filed July 16, 1912. Serial No. 709,796. (Cl. 195-12.)

This method of distilling volatile ingredients from liquids consists in heating the body of liquid to the temperature of distillation by counter-current contact with a gaseous heat-carrying medium which has an initial temperature above the temperature of distillation. By this means the body of the liquid is heated and the volatile ingredients are distilled, and at the same time the gaseous medium is cooled. The relatively cool heat-carrying medium is repeated by the relative hot residual liquid from which the desired vola-

Compressor Works on Either Air or Gas

Patent No. 1,225,805; described in Patent Office *Gazette*, May 15, 1917, page 677. Augustus W. H. Griepe, New York, N. Y., assignor to Turbo Company, a Corporation of New Jersey. Filed Jan. 24, 1914. Serial No. 814,135. (Cl. 253-189.)

This air or gas compressor has a number of concentric series of velocity increasing chambers, the entrances of which are of greater transverse dimensions than the exits. Likewise a series of pressure augmenting chambers with entrances of less transverse dimensions than the exits are provided. Each series of velocity increasing chambers and each series of pressure augmenting chambers progressively decrease in radial width, size and capacity from the center towards the outer periphery of the casing. The casing is provided with a single admission throat at the periphery, and branches are provided which lead from the throat divergently inwardly to the center of the casing, when they communicate directly with the pressure augmenting and velocity increasing chambers of the series of least diameter.

Valve Stem Operates Damper in Combined Gas Stove and Fireless Cooker

Patent No. 1,225,769; described in Patent Office *Gazette*, May 15, 1917, page 665. John E. Chambers, Shelbyville, Ind. Filed March 30, 1911. Serial No. 618,047. (Cl. 126-39.)

In this combined stove and fireless cooker the cooking compartment has an opening leading to the exterior, a burner being placed in the compartment. The valve in the burner pipe is provided with a rotatable stem. The handle of the damper in the opening from the cooking compartment is loosely mounted on the stem of the burner valve, so that when the valve is turned off the damper is closed.

Heating Apparatus Provided With Gas Burners in Top of the Oven

Patent No. 1,224,497; described in Patent Office *Gazette*, May 1, 1917, page 137. Henry W. O'Dowd, Jersey City, N. J., assignor to William M. Crane Company, a Corporation of New York. Filed Oct. 16, 1915. Serial No. 56,189. (Cl. 126-39.)

In this heating apparatus the oven has a number of apertures in the bottom, with a radiating element under the oven. The gas burner is placed in the top of the oven, the heat being conveyed from the burner down upon the element and into the oven.

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Accomplishing the Impossible

The force of any argument is always materially strengthened by a graphic or visual representation. This fact is brought home in a news item appearing elsewhere in this issue, which states that "enough natural gas goes to waste every day in Lackawanna, Luzerne and Schuylkill Counties, Pennsylvania, to put a ring of fire around the German Empire." This rather unique and timely conservation thought was expressed by Governor Brumbaugh, of Pennsylvania, at a conference of the representatives of boards of trade in the anthracite regions referred to. To carry the comparison further—if the country's total natural gas losses were thus concentrated how many times might we wrap Germany with these fiery rings?

In answer to the positive statement so often advanced on conserving this loss, that it cannot be done, the Governor's response is worthy of repetition, it being, "My answer to that is, that when it is finally settled that a thing is impossible, watch some fellow do it."

While the answer verges on the impractical, still it must be admitted that it furnishes stimulating nourishment for the most alert gas engineering minds.

There is one result that is sure to come to the man or group of men that accomplishes this seemingly impossible conservation, and that is reward—reward well worthy of the effort.

Getting Ourselves Ready to Meet Contingencies That May Arise

The President's message makes one thing certain—that we are in the war until it is won. Its winning is not to be determined by the willingness of the enemy nations to cede this or that territory, to cease—on paper—from inhuman warfare, or to pay indemnities, but by the actual elimination of such ruling classes that will insure against a repetition of the present orgy into which the whole world has been precipitated. Up to the present time no inclination on the part of the enemy peoples to meet these terms has been revealed. It looks, therefore, as if the war will be of longer duration than the general public had foreseen.

The size of our armed forces will be limited, during the duration of the war, only by our ability to equip them, to train them and to transport them. If we had 5,000,000 men available and ready to be sent into action at this moment there is little reason to doubt that such a course would be followed, and to very good purpose.

It is quite probable that a much greater number of men can be drawn into the armed service than have already been drawn without very serious readjustments having to be made in the industries. But as the drain begins to be felt, there will be a tightening up in exemptions, and perhaps an extension in age limits. It will not be enough for the industries to say, "This man is

indispensable to our business." They may have to show that they have left no stone unturned to make him indispensable.

There are many tasks in the gas industry, not arduous, that are now being performed by men, to which women are adaptable.

Gas Works Construction in War Time

Holding back on new construction has become in many cases a necessity. Lack of labor and lack of materials are very considerable obstacles in themselves, but they can be overcome. Capital, however, is an absolute essential, and many gas companies are finding it very hard to obtain.

It requires no great delving into the principles of economics to discover the reason for this condition. The average human being when he has saved a certain amount of money wants it to make something from it. This is rational and natural.

If he is conservative he is satisfied if it will bring back to him a low rate of return provided the principal is secure. If he is speculative by instinct he is willing to chance the principal if the annual return warrants it. Absolute security and 4 per cent interest may be had by buying Government bonds. The same return and relative security may be had by depositing one's money in a savings bank.

Gas company securities as a rule appeal to the conservative type of investor. At present they are confronted with strong competition. Unless there is relief in rates, the necessity of which even the outsider can perceive, they are handicapped at the outset.

Yet it is inevitable that considerable new construction will be undertaken in the gas field in the no distant future. By-products which formerly concerned only those whose minds traveled out to the distant future have become a vital need, yet are being wasted prodigally, due to the prevalent use of raw fuel where gas would serve.

No one knows how long the war will durate. With every month that it continues we approach nearer the time when general heating by gas, universal cooking by gas and gas as industrial fuel will become a question of national concern.

When it does, and when the Government itself seeks such a condition, then must of necessity come an era of expansion and construction regardless of costs of materials and scarcity of labor, for the average plant was not erected with such conditions in view.

The far-sighted commissioner will consider this possibility seriously. There is need for rate increases for the immediate purpose of supply, adequate and proper service. There is need of a reasonable return in order that, if called upon suddenly to vastly increase their output, the gas companies shall not have to flounder around helplessly seeking to secure the capital necessary to do it.

The House Heating Era

Gas for house heating, not merely of isolated and little-used rooms, but big installations, was but a few months ago but a dream of the future. It has since become an actuality of the present; not merely in Baltimore, Indianapolis, etc., where conditions make possible unusually low rates, but in the average territory where dollar gas and higher prevails.

It has been the contention of the gas man that primary cost of fuel is the least factor to be considered in such installations. He has argued that the conveniences of gas are such that could the consumer but visualize them he would be willing to pay a higher price for his heating. But the main obstacle to sales was in making the prospect believe these statements.

Many of those who have taken to gas for house heating doubtless have done so as a temporary measure. In fact, some gas men are not over-enthusiastic about putting the business on these lines.

But the fact remains that the installations are there. If the gas man was right in his previous belief, and the AMERICAN GAS ENGINEERING JOURNAL is convinced that he was, they are daily convincing the user that gas is his logical fuel for heating even if, under normal circumstances, the cost is higher. Consequently, this business is likely to become permanent. It is unfortunate that some companies through inability to obtain appliances have not been able to install as many as they easily could have.

Nothing, however, that is left to take care of itself, and at the mercy of an uninformed adjuster, will perform to favorable advantage. The gas company whose eyes are to the future will follow up these installations, which abnormal conditions have brought on their lines, with particular assiduity. It will cost something to render this service, but the investment will bring a good return in new business in times when we will be more interested in getting such business than we are at present.

Correspondence

Preventing Flash Back

SIR: Referring to a short article in the Nov. 17 issue of the JOURNAL, written by A. M. Powell, of Los Angeles, Cal., headed "Preventing Flashing Back in Automatically Controlled Gas-Fired Steam Boilers," it may be interesting for you to know that we have had some trouble along this line, and that we have tried several pilots under various conditions, and considered working out a system of closing the air shutters when the gas is turned down, using a Minneapolis heat regulator.

You have probably noted that when lighting a gas

burner if you hold the match down to the burner and then turn on the gas you most always get a flash back.

We tried this out by placing the pilot on several burners, and noted that the burner which the pilot was nearest would flash back every time.

To overcome this the pilot was extended to the back of the burner and about 6 in. above the burner itself.

This gave the air and gas a chance to become well mixed from the air mixers and the burner before ignition took place.

This has prevented flash backs on these burners.

While this may not be a solution in every case, it has worked out in this instance, and I thought it might be of interest to you.

C. D. Bond,
Special Representative Old Colony Gas Company.
East Braintree, Mass.

Tight Belts Not Essential to Positive and Efficient Transmission

It is gradually being learned that tight belts are not essential to positive and efficient belt transmission. The most important points to be observed in the care of belts is to keep them from getting hard, dry and stiff. A pliable belt lies down close on the pulley, and every available square inch of pulling surface is brought into active contact. The coefficient of friction of the belt is thus brought up to its maximum value, and the top or non-pulling side can be relieved of much of the initial stress. In fact, in many cases the non-pulling side is relieved of all tension and made to run with the slack side almost touching the tight side.

The belt scale is not a solution for the belting problem. It is merely a solution for making belts tight. It was Taylor's theory that belts must always run at a certain tension in order that they do not slip. His theory was based upon another theory, which, in turn, was based upon tests of belts that were apparently dry, and perhaps hard and stiff. Just recently we had another example of tests performed on belts by "theoretical" rather than practical men, and, as a result, they drew conclusions that do not suit waterproofed belts. It is my conviction that belts should be waterproofed. A waterproof belt does not stretch and tighten with variations in humidity.

Cases are on record where belts were taken up "as per belt scale" on a day when the atmosphere was exceptionally humid. They were therefore in a stretched condition. The next day was dry, and the natural tendency of the belts was to shorten. Shafts, however, are almost immovable, and the resulting high tension created hot bearings. Quoting an engineer, "When I started up after tightening the belts the fun began. Bearings went hot right and left. The manager turned water on the bearings. Boxes on the main driving shaft melted out. One 10-in. belt broke; others ran off. The manager (who instructed the engineer to take up the belts in the first place) came running, yelling at the top of his voice to stop the engine. The owner 'fired' the manager, and it took three and one-half days' work rebabbitting the boxes and letting out and splicing the belts before the plant could be run again." That, in a nutshell, explains what sometimes happens when Taylor's method is applied too religiously.

The principal thing desired in a belt is to "transmit power without slip." Experienced belt men know that this can usually be done without running the belts tight. As already stated, pliability is the thing to seek in belts, for the more pliable the belt the greater the coefficient of friction. Soft India rubber, for instance, has a very high coefficient of friction. Why? Because it is so pliable. Have you ever noticed that rubber hardens with age, and as it hardens it loses its so-called "stickiness"? That is really nothing more or less than a reduction in the coefficient of friction.

The same is true of leather, cotton, hair or any other kind of fibrous belt. As long as belts are pliable they don't need tightening. I am not claiming that belts should always run real slack. It is often impossible. Much depends upon the distance between shaft centers, character of drive, speed, size of pulleys, and character of driven machinery. Under no circumstances, though, is it good practice to run belts extremely tight. The greater the distance between shafts the greater the ease with which slackness may be maintained, yet I know of short belts that are real slack, one belt in particular that is 5 ft. between centers, pulleys 12 and 15 in. in diameter, the speed of the belt high, and the slack side almost touches the tight side.

One of the greatest blessings of the slack belt is the fact that it seldom has to be "taken up." Most of the time spent in caring for "Taylor system belts" is consumed in tinkering with the belt scale, cutting out slices "every so often," and then replacing. But with slack belts it is seldom necessary to take out a slice. The rule with slack belts is, "the slacker the better." I know of drives that have run for over fifteen years without being touched by a knife. So, in the light of actual comparison between "Taylor's system" and the "judgment system," I do not recommend the former, with his belt scale. I prefer the "cared-for belt," the belt that is treated correctly, made pliable, waterproofed and slack.

About the best way to prevent tightness is to use a belt that, in the first place, is wide enough. Don't skimp about paying a little more. Use the old rule of thumb, "a single thickness belt 1 in. wide running 800 ft. per minute will transmit 1 hp.," and you will be safe. Then, don't use pulleys that are too small. I prefer larger pulleys, because with them there is much less danger of slip, a narrower and less expensive belt may be used, and the belt speed is higher. A speed as high as 4,000 or 5,000 ft per minute is not too high. In some places the conditions do not permit wide belts, especially on reversing drives. This is one of the hardest belting conditions to meet. In order to keep such a belt from being stressed too highly, it must be made thick. Its being thick is all the more reason why it should be kept in as pliable a condition as possible. Reverse-drive belts should be kept "snug" on the pulleys, but never tight. Keep them pliable.

I know of a case in England where a camel's-hair belt was giving much trouble while running tight. It slipped in spite of the tightness. Later the belt was given the care it deserved, and is now running slack, without slip, and is pulling a larger load than it did before. In Pennsylvania is another belt that was once run tight by use of an idler pulley. This is a leather belt. After due care the idler was dispensed with, and now the belt runs slack.

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Merchandising Gas

Sale of Water Heaters of One Company Up to October 100 Per Cent Greater Than in all of 1916

Up to the middle of October, the number of automatic water heaters sold and installed and in every-day use throughout the whole territory of the Public Service Company of Northern Illinois, was nearly 100 per cent greater than during the year 1916. In some of the divisions the increase was in even greater ratio. In "D" the increase was nearly 150 per cent. In "O" five times as many automatics were sold as were disposed of in the twelve months ending Jan. 1 last. The allotment made in both divisions was exceeded.

Sales of all water heaters—the automatic and the tank types included—for the period mentioned, ran ahead of the total of the preceding calendar year with over ten weeks yet to go to complete the year 1917. The figures given included sales by the company's sales department and by plumbers. The former is far in the lead.

Advantages of Gas for House Heating Increasing

Gas as a fuel for the complete heating of houses grows more important. We are receiving numerous inquiries concerning it, declares H. H. Clark, of the Public Service Company of Northern Illinois, in a recent article in the *Public Service Lumen*. The merit of gas for the purpose is revealed in a comparison of the heat units it carries with those of different kinds of coal. Anthracite, referred to as a whole, contains 28,000,000 B.t.u. per ton. The content of Pocahontas bituminous coal is 26,000,000 a ton and of the ordinary varieties of soft coal 24,000,000. It is doubtful if any of these coals can be burned in the average domestic furnace or stove with an overall efficiency greater than 30 per cent. City gas contains 600,000 heat units per 1,000 cu. ft. With proper burner equipment it is entirely feasible to obtain an efficiency of 100 per cent. But if the latter figure be lowered to 80 per cent it will be seen the difference in cost between gas and anthracite coal, for example, is not formidable, and is in reality overcome by the numerous features of superiority in gas.

We have on our lines a few isolated gas-fired heating furnaces, and this fall have installed a considerable number of gasteam radiators. In Streator alone several houses, apartment buildings and offices have been fitted with this heating appliance.

It will not, however, be difficult to find examples of the general use of gas for the purpose in other fields.

In Baltimore the gas company has driven hard for this kind of business, summing up its advantages in these points: uniformity of temperature in the house; dust and dirt reduced to a minimum; fuel not stored in cellar in advance of season, customer paying for gas as he uses it; elimination of storage space required for coal; cleaner cellar, and hence, more extended use for it; ease of mind on part of tenant concerning firing troubles and lax janitor service; in restricted and exclusive suburbs, the abatement of the smoke nuisance and carting of coal, with the atendant dirt, across well kept paths and lawns; highly efficient fuel service.

Investigation Shows That Pipe in Automatic Water Heaters Lasts Longer, Due to Control

To determine the life of water pipe in buildings under varying conditions of service, Thomas F. Payne, a sanitary engineer of Pittsburgh, was commissioned by the A. W. Byers Company, makers of iron pipe, Pittsburgh, to make a house-to-house canvass. It appeared that from the investigation that the pipe lasted a little longer where an automatic water heater was used. This is regarded as due to the possibility that a lower temperature of the water is maintained than with a heater without thermostatic control, corrosion increasing with temperature and reaching its maximum between 140 and 170 deg. Fahr. Temperatures from 115 to 130 deg. are recommended wherever they will serve the purpose.

Gas and Electricity Being Merchandising Specialties Must be Sold Accordingly

C. A. Magee Outlines Baltimore Company's Merchandising Policy — The Utility as a Specialist in Home Comfort, Convenience and Economy

Gas and electricity would be classified by a professional merchandiser as specialties of the most extreme type, inasmuch as they have no intrinsic value whatever as commodities, considered alone, declares C. A. Magee, manager of merchandising and domestic sales of that company, in a paper written for the Merchandise Department School of the Consolidated Gas, Electric Light & Power Company, of Baltimore. They are worth absolutely nothing until used, and are consumed in the process of utilization; they cannot be handled nor stored for future use; they have no second-hand, scrap or resale value. In fact, they should not be considered as commodities at all. They represent a service rendered, and their distribution assumes not merely the character of the ordinary delivery of goods, but of the assignment to each customer for his individual use an amount of equipment and labor at all times standing ready to serve him. The value of this service depends largely upon its readiness at all times for instantaneous, continuous and satisfactory response to the customer's demand.

Distribution Presents a Variety of Special Problems

Gas or electric distribution thus presents a variety of special problems and great difficulties, requiring immense investments; yet when accomplished this work is not a business in itself; it is an operation whose effort results in placing gas and electricity in a potential position where still further effort is required to make them of greatest value.

The householder cares nothing for these elements by themselves; he is interested only in what they may be made to do for him. Their value increases with the degree of intelligence and judgment applied to their

utilization. Their misuse is attended with dangers peculiar to themselves, which must be studied and guarded against.

Comparatively few people would be amenable to abstract argument as to their merits in the home. If it were possible to educate the public to their potential value, to the point of complete utilization for all possible purposes, the process, if carried on by abstract methods, would be so slow and expensive as to be prohibitive. And if the sale of gas and electricity had to bear the cost of this kind of education, the selling price would be so high that they would be beyond the possibilities of profitable utilization by the great mass of the public. The history of the gas business during the period when the companies were content to accept such business as was offered to them demonstrated that the public, if left to itself, would not use sufficient gas to permit its sale at a moderate price without loss to the supplier. The price was high because sales were slow.

When, therefore, the active promotion of sales is projected, it is evident that the passive education of the public must be supplemented by other means, and there is a call for some auxiliary sales movement which should reduce the difficulty of education to concrete advantages to the public, and would induce the public, through self-interest, to assist in the educational process. This leads the sales department to select and offer to the public, instead of gas and current in the abstract, appliances through which their convenience and economy can be made self-evident to the prospective consumer. This movement at once has a great stimulating effect. Less is said of gas and current and more of what can be done with the appliances. The number and variety of these appliances is multiplied, special sales methods introduced, and, step by step, a very considerable business in appliances is developed, with most satisfactory effect upon the sales of gas and current, though now no effort is made to sell them directly. The primary specialties are sold in greater volume indirectly through effort put forth upon what, curiously enough, now becomes the principal business of the sales engineer. It is proven that if the auxiliaries are forced to the highest degree, the primary business grows far faster than if the effort were made with it directly. From the nature of the commodities concerned it could not be otherwise; the intangible, hard-selling specialties —gas and current—grow with the growth of the means by which alone they can be made of value. And the more energetic and persistent effort that is placed behind the appliance sales, the less need there is to worry about the increase in output of gas and current.

Selling Difficulties of Specialties

But here again we face the fact that the appliances are themselves specialties, though not so extreme in type as gas and current. They are made for specific uses, and are of value only when combined with the gas and current; they cannot be used at all excepting when so combined, and, as specialties, they require special sales treatment, special sales plans and the same special education of the public as would be required to induce the sale of gas and current themselves, though the appliances offer the concrete advantages that make the influencing of public opinion a less difficult matter. Still, they are specialties, subject to all the selling difficulties peculiar to specialties. They are not necessities, for living is possible without them, even under the present-day idea of living, to the great mass of the people; they are not luxuries, for many of them are not yet in the homes of the most luxurious livers.

The marketing of any specialty is an expensive operation. A long course of educational advertising is necessary to create a demand on the part of the public. This must be accomplished by circularizing, by personal solicitation, by demonstration, and by every conceivable sort of appeal, direct and indirect. New sales plans must be under construction constantly to keep public interest stimulated to a high degree. If the specialty be an expensive one, the sale, when made, means that the demand has been filled, so far as that individual purchaser is concerned, for an indefinite term of years. In very many cases the supplier must finance the transaction to permit the buyer to consider it at all, involving a long-term investment, slow turnover of capital and expensive bookkeeping and collection operations, with considerable liability to bad debts.

But if some way can be discovered that will result in placing the specialty in the class of general merchandise, if it can be tied up with the ordinary course of every-day life of the public, or if it can be made an integral part of some movement on the part of the public for the good of the public itself, then the selling problem becomes one of distribution only; the expense of selling is overcome, and the volume of sales increases almost without limit. This we have already done in forcing the sale of gas and current through the sale of appliances. Is it possible now to repeat the process so as to greatly stimulate the sale of appliances?

Utilities Have Entered the Merchandise Field

In the first place, we cannot refuse to acknowledge the fact that in selling appliances we have entered the merchandise field, only we have not done so frankly. Our position as merchandisers has been of growth, almost without our recognition of the character of the development; we awake to find ourselves in it, so to speak. And upon our awakening we total up the volume of business we are doing in that line, and find that it represents a very respectable amount of money annually.

This being so, our merchandise operations should be conducted according to merchandising principles, if we would derive from them all of the benefit we are entitled to expect. The closer we approach to these principles, the greater will be the result upon our appliance sales, and consequently upon the sales of gas and current.

Creating a Demand

A mercantile concern committed to the sale of slow-moving merchandise which it was forced to handle in volume would seek an indirect way to create a demand and to popularize the article. It would investigate the field surrounding the article in its use to the consumer. It would study exhaustively every variation in the purpose for which the article could be used. Then it would select certain lines of merchandise in which the customer was voluntarily interested in daily use in operations closely allied with the purpose for which the specialty was designed, and would plan its campaign to attract

public attention to these collateral and allied lines as leaders, taking care to show to every customer whose fancy was caught by the leaders. In this way public knowledge of the specialty would be spread so rapidly and with such hearty cooperation on the part of the consumer that it would grow out of the specialty class with a minimum of effort.

Few Appliances Used Alone

Aside from its use as a means of inducing sales of appliances, this expansion of our merchandising activities deserves our very serious consideration for another reason, which involves the thoroughness of our work. Very few of our appliances are used alone; most of them require some other articles to complete their action, and, in some instances, these other articles may have a decided effect upon the efficiency or the method of use of our products.

Consider the gas range. Gas may be turned on and lighted, but very few operations in the home can be accomplished by the direct application of the flame. Almost every article to be cooked requires the use of some container or holder which interposes a material of some sort between the flame and the food. This container or holder may be of aluminum, steel, earthenware, or even glass. It may be heavy or light in thickness. It may be a good conductor of heat or an insulator.

We are justified in pointing out with great emphasis that there are just two persons who are vitally interested in the efficiency of these cook vessels—the first is the man who pays the fuel bills; the second, the supplier of the fuel. It might be said that the manufacturer of the vessels should be included, but he is not *vitally* interested; the output of his product is not at stake; his wares can be used with other sources of heat; his cook vessels are accepted by the user as the correct thing, and as being incapable of failure in the performance of their function, and experience has proven that the first impulse of the cook is to blame the gas with shortcomings in the cooking rather than the cook vessels or the operation. Then, again, the permanently continuous daily flow of gas depends upon the success with which it is used. A cook vessel, once bought, is good for years of use. If, now, improper vessels are used or inefficient, the quantity of gas used for a given operation may be greater than is actually necessary.

Keeping Quantity of Gas Used Down to Smallest Degree

The greatest permanent benefit results to the gas supplier when the quantity of gas used is kept down to the lowest degree possible for the actual work to be done. Thus the supplier is required to study every movement in the preparation of food, and to take the lead in fostering the highest efficiency in this operation. It is evident that this involves not only exact knowledge of the various forms of cooking utensils, but of foods and their qualities as well.

If we want to sell washing machines to best advantage, it is not sufficient that we know motors and their regulation as applied to the washing machine and wringer; we should know fabrics; we should know about lace curtains and towels and handkerchiefs, and blankets; we should know about water temperatures and soaps—in fact, if we supply the energy for laundry work, we should know how to apply that energy to get the best results, and we should know all about every collateral factor that may have an effect upon those results.

The same thing may be said of other appliances. For instance, we learn that some ladies take the bag off the vacuum cleaner, reverse it, place it on the register or radiator and use it for a hair dryer. It is probable that we have not learned all things that a vacuum cleaner will do. Certainly we are not competent to instruct in its use unless we know how to treat the different naps on carpets and rugs, the different sorts of upholstering on furniture and the entire details of the science of cleaning house.

We can go much further than the utilities in this movement. In our policy of selling light rather than the current that produces light, we are interested in the lighting fixtures. If we live up to our opportunities in this direction, we enter into the field of home decoration, for it is unthinkable that we should neglect the necessity for harmonizing these with the general scheme of decoration of the home. We need only mention the first duty of providing light that will save the eyes of the people who must use it. Beyond that we must learn correct practice in decoration, which is emphasized when we regard our table and floor lamps with the great variety of designs in base and of shape and color of shade.

The proposed equipment of furniture with wiring and outlets for the use of various appliances, as, for instance, dressing tables with an outlet for boudoir lamps, vibrators or curling iron; serving tables with outlets for chafing dishes and percolators; library tables with outlets for reading lamps, and so on, forms a link between the use of electricity and the manufacture and sale of furniture, still further emphasizing the fact that home decoration, of which the proper selection of furniture is a part, is well within our province.

Importance of Auxiliaries

The importance of these auxiliaries in the completion of the effect of our appliances and the great range which our products cover become apparent when we schedule the functions we are prepared to perform in the home. We enter every part of it and participate in almost every operation:

The Basement—A house-heating plant equipped to burn gas instead of coal, with thermostats and timing devices that permit the householder to light the furnace fire at the beginning of the heating season and turn it off at the end with absolutely perfect regulation of temperature in the house night and day, regardless of the weather.

The Laundry—Equipped with washing machine, electric or gas iron, clothes dryer, water heater, laundry stove.

The Kitchen—Equipped with gas or electric range, fireless cooker, water heater, incinerator, electric refrigerator, dish washer, utility motor for polishing, grinding and sharpening.

The Dining Room—With side table or tea cart equipped with percolator, egg boiler, chafing dish, grill and toaster.

The Boudoir—With its reading lamps, the lighting equipment for its furniture, the vibrator, the curling iron, heating pads, water heaters.

The Nursery—For which we have milk warmers, heating pads, water heaters.

The Den—With its soft lighting effects, its cigar lighter.

The decorative effect throughout the entire house of the infinite variety of table and floor lamps.

The scientifically correct lighting fixtures, providing light of proper quality, sufficient quantity and convenient location. The decorative effect of the fixtures themselves.

The convenience of push buttons and switches with correct wiring combinations to light up before entering and turn off lights after leaving a room.

Individual room heaters of every description of any capacity.

Fans for cooling in summer—ceiling fans, desk fans, wall fans—infinite in variety.

The vacuum cleaner, with its thousand and one uses.

Sewing machine motor.

This is a list of which we may well feel proud. It entitles us to say that if all our facilities are used, the servant question loses much of its vexation, the housekeeper becomes more independent, time and trouble are saved. But with the feeling of pride we ought to accept it as a stimulus to greater service to the public.

Selling Collateral Lines

The stimulation of the sale, the extension of the application and the protection of the efficiency of our appliances, call upon us to go still further into the merchandising field if we want to be thorough in our work. We should sell not only the appliances, but the collateral lines that go so far to make these appliances necessary or desirable or attractive. We should not only offer them for sale, but we should know more about their use than anyone else, since they are so greatly affected by our primary products and have so direct a bearing upon our primary business.

It is our legitimate field. No other line of business can present even a small portion of the justification that we cannot only claim, but prove. Cast aside for the moment the prejudice built up by years of pursuit of one fixed purpose by one fixed method; forget the isolation of the public service corporation, and conceive, if possible, the present situation, created in a day, with no traditions to hamper our freedom of action. Would it not be the natural thing for us to operate under a broad policy that would permit us to really serve the public in the broadest sense in the utilization of gas or electric supply instead of maintaining the more or less passive attitude of being ready to serve? For no one can deny that the mere manufacture and distribution of gas and electricity is a process of being ready to serve, since we have seen that the gas and electricity are of no value until used.

Beyond our meters lies a field of real usefulness—a field that has apparently been held, waiting for us to wake up and take possession. And it very much merits the attention, for it is the one place that has been neglected in this day of the gospel of efficiency.

All sorts of efficiency, time and labor-saving machines have gone into the office and the factory. Expert systematizers and efficiency engineers have been studying to increase production, reduce lost motion and utilize waste or eliminate it. Welfare movements in every conceivable variety are taking care of the bodily health, the mental development and the financial future of the men and women engaged in carrying on the business of the world. Lawmakers are busy at every legislative session, thinking up new ways to safeguard the workers. Hours of work, wages, compensation for injury and the multitude of other protections that have been built up are general now—all in favor of the producer of wealth.

But the woman at home is still using the broom, still cooking her meals over the heat of the stove, still doing her own laundry work or worrying with the laundress, still working all day and part of the night, still wearing herself out with physical exertion that ought to be done for her.

But to-day there is no one concern that pretends to cover the entire field of home efficiency, economy and comfort as a business, offering for sale the helps that are available for the housewife, specializing in the service that should provide advice and instruction to back up its claim. Some there are who cover part of the ground, but none cover it all, and its nature makes it possible for the entire field to be covered.

An Active Force

There are magazines published for the sole purpose of educating women in greater efficiency in home operation, as *Good Housekeeping*, for example. That magazine not only employs the best and most practical writers for the purpose, but it maintains laboratories for the actual testing of the things that it advocates; it guarantees its advertisers and their offerings, and it makes its guarantee good; it will test any home device that applies under practical conditions, and its certificate of approval, when given, is widely advertised by manufacturers.

But it sactivities cannot be more than educational, and, as it sells education and service naturally limited, it cannot act more specifically than it is now doing toward the introduction of efficiency in home operation. Nor aside from this and other magazines is there any other agency at work at this time in this field—moreover, there is none that is equipped for it, either by reason of service or lines of merchandise directly bearing upon the subject. Excepting one—the gas or electric company. And with its present equipment and facilities as a nucleus the company should acknowledge that its duty is to give practical effect through its merchandise department to every principle comprehended in the term "home economics." It should offer to its customers such appliances, accessories, utensils and other merchandise as are necessary or desirable to lighten the burden of home operation, increase the comfort of the home and help to make it the bright, cheerful and happy spot that every human being is entitled to.

We have attempted here to sketch a plan for an expansion of operations that, if enlarged upon, will gather within itself as a logical movement all of the different things that we are doing in the domestic field; to center them in a fixed direction; to make our promotion department not only a promotion department, but a business institution in itself, with its own right to existence, its own function in the world; and in doing this have tried to construct a movement which should give to the public service business that bond of human interest with its customers that is so badly needed to help the industry over the impersonal, isolated, aloof attitude which it has felt so keenly, but which persists, in spite of all protestations of good-will and desire to serve; to make individual customers of the public instead of merely so many meters; to make friends of customers by multiplying the services that can be rendered to them. And we think of no higher ambition for the domestic promotion department of gas and electric companies than to live up to the full meaning of the claim that they are the specialists in home comfort, convenience and economy.

News of the Gas Industry

New Rates Filed by Fayette County Company Affect Many Pennsylvania Towns

The Fayette County Gas Company has filed with the Pennsylvania Public Service Commission a new tariff of rates for the supply of natural gas, to become effective on Dec. 1, 1917.

The new tariff provides for an increase to consumers included in Class 2—preferred (consumers who desire a fixed, definite and continuous service other than in residences, stores and other like places), from 30 to 35 cents per thousand cubic feet. The rates to consumers included in Class 3—non-preferred (consumers to whom in case of shortage may be discontinued in order to supply Classes 1 and 2), are increased from 30 to 35 cents per thousand cubic feet for the first 150,000 cu. ft. per month; from 24½ to 32½ cents per thousand cubic feet for the second 150,000 cu. ft. per month, and from 18½ to 27½ cents per thousand cubic feet for all in excess of 300,000 cu. ft. per month.

The towns and cities served by the Fayette County Gas Company are Connellsville, Dawson, Dunbar, Everson, Masontown, Mount Pleasant, Scottdale, Uniontown, Vanderbilt and Youngwood. Pa., and the unincorporated communities of Alverton, Hopwood, McClellandtown, New Salem, New Stanton, Ronco, Ruffsdale and Tarrs, and territory immediately adjacent thereto, in the counties of Westmoreland, Greene and Fayette.

10 Per Cent Wage Increase by New Bedford, Mass., Company

The New Bedford (Mass.) Gas & Edison Light Company has raised the wages of its 300 employees by 10 per cent. The increase went into effect Dec. 3. This is the third wage increase that the gas and electric light company has granted within eighteen months. Each of the two previous advances was 10 per cent.

New York Companies Make Agreement on Toluol Extraction

The Consolidated Gas Company, of New York, has reached an agreement with Washington officials to manufacture toluol, a by-product of heat unit gas, to help meet the shortage in this war essential. Toluol, as is well known, being the ingredient used in compounding the high explosive T. N. T.

It is understood the Government is to pay for the erection of stills and the company will furnish the labor. The product will be furnished to the Government at actual cost. As soon as the stills are completed the company will make every effort to facilitate production.

The Brooklyn Union Gas Company, which has made a similar arrangement with the Government, expects to produce about 800,000 gallons of toluol annually. Production of the Consolidated's plants, it is estimated, will exceed 1,000,000 gallons a year.

The gas companies' decision to manufacture toluol means that the gas will be changed from the present candle-power standard to the B.t.u.

Increase Asked for Three More Northern California Communities

The Northern California Power Company has applied to the State Railroad Commission of California to have its rates for gas increased in Redding, Red Bluff and Willows.

The application is based upon the increased cost of material and supplies. The present rate is $1.50 per thousand cubic feet for the first 5,000 ft. of gas used in a month, $1.25 a thousand cubic feet for the next 10,000 cu. ft., and $1 per thousand cubic feet for all over 15,000 cu. ft. per month, with a minimum meter charge of $1 a month.

Greenfield, Mass., Increase Announced

Announcement has been made by Greenfield (Mass.) Gas Light Company that on Dec. 1 the price of gas was raised 10 per cent.

10 Per Cent Surcharge to be Added to Net Bills of Cincinnati's Large Consumers

The Union Gas & Electric Company has notified its consumers that it had filed with the Ohio State Public Utilities Commission a supplemented rate schedule, effective Dec. 20, under which there will be a surcharge of 10 per cent added to the net bills.

It is explained that this increase is necessary because of the increased cost of operation imposed by war conditions, only a portion of which will be offset by the new surcharge.

In explanation of the new schedule H. J. Hoover, manager of the commercial department, said:

"The largest single item of expense is fuel, the cost of which has during the first nine months of 1917 increased 42 per cent over the actual cost for the corresponding nine months of 1916. The next largest single item of expense is labor, which item for the nine months of 1917 shows an increase of more than 12½ per cent over the corresponding nine months of 1916.

"It will be seen that with the surcharge of 10 per cent added our company will still be sustaining a heavy burden of increased operating cost, which it is willing to assume up to the point where it will not render it impossible to maintain its high standard of service. The surcharge is intended to meet, in part, the unusual conditions, and will be withdrawn whenever changes in such conditions warrant."

Higher Rate Granted at Duncan and Marlow, Okla,

The Oklahoma Corporation Commission has granted the application of the Western Gas & Fuel Company for an increase in gas rates at Duncan and Marlow, Okla., from 25 cents to 35 cents per thousand cubic feet; the order became effective Dec. 1. This is in line with the ruling of the commission in several towns in Oklahoma granting higher rates.

Saving of the Enormous Natural Gas Waste Discussed

Enough natural gas goes to waste every day in Lackawanna, Luzerne and Schuylkill Counties, Pennsylvania, to put a ring of fire around the German Empire. In the entire anthracite region 72,000,000 cu. ft. of natural gas, representing 144,000,000 hp., are lost every twenty-four hours.

These facts, Governor Brumbaugh of Pennsylvania told a conference of representatives of boards of trade from the anthracite regions recently, were so important that he was of the opinion that the time had come to "do something." Of course, the Governor said, the easy way out of the matter was to say that the escaping gas seeped away through innumerable openings from the mines, that no one had ever devised a plan for collecting it and that the thing could not be done.

"My answer to that," said Governor Brumbaugh, "is that when it is finally settled that a thing is impossible, watch some fellow do it."

The Governor did not present any plan for capturing the 144,000,000 hp. wasted daily. His practical proposition was that the anthracite commission interest themselves in the matter, form an organization and offer a prize of $10,000, $20,000 or even $50,000 to the man who devises a method of utilizing the energy now going to waste in the anthracite region.

It was suggested that the boards of trade in the anthracite region arrange for a meeting in the near future, at which the Governor would present his views in greater detail.

A Correction

In the Dec. 1 issue of this JOURNAL a statement was made that the new coke plant in East St. Louis of the St. Louis Coke & Chemical Company was the first to attempt to use straight Illinois coal in the manufacture of coke.

A. H. Harris, Jr., superintendent of the Coal Products Manufacturing Company, Joliet, Ill., in telling us of our misstatement informs us that his company has been using Illinois coal for this purpose for approximately eighteen months, although at present it is manufacturing blast furnace and foundry coke on a mixture of 40 per cent Illinois, 40 per cent West Virginia and East Kentucky gas coal and 20 per cent Pocahontas.

According to his knowledge several attempts at various plants have been made to carbonize straight Illinois coal for metallurgical coke, but Mr. Harris does not believe any of them have been successful where the product was to be used for metallurgical purposes.

When this coal is properly mixed, however, with good coking coals the results are quite satisfactory.

Boston Consolidated Raises Price 10 Cents

The Boston Consolidated Gas Company has given public notice of an advance on Jan. 1, 1918, of 10 cents a thousand cubic feet on gas distributed to consumers in its territory. The reasons given for the increase are the higher costs of labor and materials used in manufacture. Furthermore, the company says: "On account of the requirements of the army and navy for by-products of gas from which high explosives are made, we believe that our consumers using gas for illuminating purposes will be much better pleased with the results, both from economical and illuminating standpoints, if mantle burners are utilized for lighting purposes instead of open flame burners. Consequently, we will furnish and attach, free of charge, for each of our 178,000 customers, on application, one of the C.E-Z. Welsbach burners which sell for $2.50. The mantle type of burner is recommended by the Government (see circular of the Bureau of Standards, No. 55), and gives five times as much light as the open flame, and uses 40 per cent less gas.

Complaints lodged with the Massachusetts Gas and Electric Light Commission were met with the response that the company has a right to raise its price without the board's authorization. Commissioner Morris Schaff stated that under the sliding scale act, in operation more than ten years, the company may increase its price without consulting the commission. The latter cannot fix the amount of the increase and the company need not seek the board's sanction. On formal petition from a number of customers, however, the board can adjudicate the raise after public hearings.

The price now is 80 cents per 1,000 cu. ft.

New Sliding Scale and Zone Decision Fixed at Los Angeles, Cal.

The application of the cities of Los Angeles and Pasadena before the California State Railroad Commission that each be considered as complete districts or zones for rate fixing and that a uniform rate schedule be made to apply over the entire city of Pasadena and another uniform rate to apply over that part of Los Angeles served by the Los Angeles Gas & Electric Corporation was granted recently.

With the exception of the San Fernando, Westgate and Palms districts, the city of Los Angeles proper is treated as one zone under the commission's ruling. These outlying districts are supplied with natural gas and consequently are subject to the natural gas rates. The harbor district is supplied by the Southern Counties Company and is not subject to the new rates. The sliding scale fixed for Los Angeles proper follows:

First	5,000 cu. ft.	68c. per 1,000
Next	5,000 cu. ft.	65c. per 1,000
Next	15,000 cu. ft.	55c. per 1,000
Next	25,000 cu. ft.	50c. per 1,000
Over	50,000 cu. ft.	45c. per 1,000

"The very large percentage of small consumers," said City Attorney Stephens, in discussing the question, "will come within the first rate of 68 cents. The lower rates of 45 cents and 50 cents no doubt will cover the hotels and apartment houses."

According to the commission's decision, the new rates become effective on Dec. 5.

Continuing City Attorney Stephens said:

"Pasadena is treated as one zone or district also. The rates fixed for Los Angeles will not extend automatically to any future annexations of territory."

He also pointed out that the commission's decision fixes an 85-cent rate for domestic consumers in Compton, San Fernando, Burbank and Vernon.

Further he said:

"As to the use of excess gas for industrial purposes, where the guaranteed bill is $75, the rate is fixed at 30 cents per 1,000 cu. ft.; where the guarantee is $150, the rate is 25 cents, and where the guarantee is $200, the rate is 20 cents.

Stock of California Company to be Sold to Improve Distribution System

The State Railroad Commission of California has authorized the Producers' Gas & Fuel Company to sell 1,000 shares capital stock of a par value of $100 a share at not less than $80 net, the proceeds to build the company's natural gas distribution system in Kern County.

The company was organized at the beginning of this year to operate in McKittrick and adjoining territory, including the Belridge and Lost Hills oil fields in Kern County. The company's purpose is to sell natural gas to oil producers to be used as fuel under steam boilers, topping plant stills, etc., in lieu of crude oil, and to serve the city of McKittrick with natural gas for domestic purposes. It has already built part of its distribution system and has six consumers in the oil fields, getting its natural gas supply from E. L. Doheny at 5 cents for 1,000 cu. ft.

Results of Binghamton, N. Y., Gardens Tabulated

The plan of giving over to the employees of the Binghamton Light, Heat & Power Company plots of ground to be worked as gardens proved very successful, each man taking one of these gardens feeling that he has been well repaid for his labor in having the fresh vegetables and helping to reduce the high cost of living. Approximately the following amount of produce was raised on the company's land near the new power house during the past summer: 180 bushels of potatoes, 25 bushels string beans, 6 bushels dry beans, 1,200 head of cabbages, 15,000 ears of corn, 25 bushels turnips, 10 bushels cucumbers, 25 bushels beets, 30 bushels tomatoes, 40 squash, 60 heads of celery, 15 bushels peas, 20 bushels onions, 5 bushels parsnips, 50 pumpkins, and 2 bushels carrots. This represents a total of $1,260.

Coal Company Merger to be Discussed

The merger agreement by which the Westmoreland Coal Company may absorb the Penn Gas Coal Company and the Manor Gas Coal Company, two subsidiaries, will be voted on at a meeting of the stockholders Dec. 11.

Massachusetts Commission Names 528 B.t.u. as New Standard

At a public hearing on the proper heat value standard to be adopted in the State, held on Dec. 4, the Massachusetts Gas and Electric Light Commission announced that after careful study of the tests made by the Inspection Department for a period of about a year and a half, it has tentatively reached the conclusion to adopt the French standard, viz., 528 B.t.u.

In an opening statement Chairman A. R. Weed recalled that on the board's recommendation the Legislature passed an act at its 1916 session relative to the establishing of a calorific standard. On June 26, 1916, the board held a hearing, when it announced that it would conduct for at least six months a practical test of heat values of gas not made under candle-power requirements which would deliver to customer the greatest value for his money in view of the uses to which most gas is devoted, and the economic conditions affecting its production. The board suspended the candle-power standard for nineteen plants of various types. Blanks were supplied to companies for daily and weekly tests and reports.

The time was later extended so as to include both winter and summer conditions, and a report to the board by Chief Inspector Charles D. Jenkins is about to be issued.

"The entrance of the country into war introduced a new factor of great importance," said Mr. Weed, in the Government requirement of materials for high explosive shells. The gas committee recognized the fact that coke oven plants of gas companies would be drawn upon to supply large quantities.

"Removal of the toluol from commercial gas, even if the benzol be returned, reduces substantially the candle-power, but insubstantially the heat value; if, on the other hand, the benzol is not returned, the loss in heat value becomes substantial," Mr. Week's statement continued. "It is worthy of notice that the past year's experience has demonstrated that considerable differences in the heating value of the gases made by the experimental plants has not made a corresponding difference to the customers, so long as the gas distributed is stable and uniform and fixtures are properly adjusted for its use. As to the elements containing the toluol and benzol, even if they are not needed by the Government, there is some ground for the belief that in the future demands of industry, which will be brought more into life by the war, they will be more valuable to the consumer if recovered and credited to the production costs than delivered into the mains.

"It is customary in most jurisdictions to express a heat value standard for gas in terms of a monthly average, but in no event on any day to be less than a certain prescribed minimum. The difference between these amounts is never less than 25, and usually as high as 50 B.t.u. The ordinance recently adopted in Chicago prescribes 'a total heating value on a monthly average (made of the average of the daily averages) of not less than 565 B.t.u. per cubic foot, and a daily average for any two consecutive days (made up of the average of the daily averages) of not less than 540 B.t.u. per cubic foot.' The English practice is similar, and, under war conditions, to provide for the recovery of toluol, monthly averages of 540 to 550. The law in this State, however, requires the establishment of an actual minimum below which the heat value of the gas should never go, and therefore will involve the adoption of some margin of safety by the operators of gas works."

The chairman pointed out that the standard named will permit the companies to recover toluol and benzol, and experience will determine whether it secures to the customer the most economical and efficient service. The standard will be modified if sufficient reasons appear to justify a different conclusion.

The present candle-power standard, 16, will not allow companies to meet the Government requirements, said Mr. Weed. He regarded candle-power as a method of testing the value of gas as having served its purpose and generally abandoned. The board, therefore, proposes to ask the Legislature to strike this provision from the present law.

E. C. Mason, of the Athol Gas & Electric Company, suggested that many smaller companies will feel that the standard is fair and workable, but will need practical experience to determine the working of the new standard.

Commissioner Morris Schaff said the board will be pleased to send its inspectors to aid all companies in

getting on the new basis. He believed the companies will do a more profitable and more satisfactory business than under the former standard.

E. C. Dwelley, of Lynn, asked whether the board had estimated possible changes in the costs of production, to which the chairman responded that the investigation of the inspectors was purely scientific.

Commissioner Schaff pointed out that the board's purpose was to set a standard and make a change that would be beneficial to both customers and companies, and that this will surely result under normal conditions. He considered the present to be an inopportune time to raise issues on the cost of production. One potent reason for the proposal to change the standard was the board's anticipation of demands on the part of companies to raise their rates. Later, cost data will be gathered, possibly every six months, and this will be available to the public.

Albert E. Pillsbury, attorney for the gas interests, asked whether the board intends to recommend the abolition of the candle-power standard. The chairman replied that this measure lay with the Legislature. Mr. Pillsbury thought the candle-power standard should be abolished simultaneously with the establishing of the calorific standard. He believed that if the latter had been set up when the Welsbach burner came into use, the public would long have enjoyed cheaper gas and the companies a larger volume of production.

Mayor Hinman, formerly State gas inspector, spoke on the general desirability of the heating standard. There was no opposition and the gas people evidently were favorable. Many expected a higher standard.

Industrial Fuel Class Formed in Chicago

Employees of the industrial fuel division of the Peoples Gas Light & Coke Company, of Chicago, have formed a class under the auspices of the National Commercial Gas Association. F. F. Cauley, head of the division, is leader of the class, which has ten members. The class meets every Tuesday and Friday from 4 p. m. to 5.30 p. m. Beginning with a review of such general subjects as English and mathematics, the course within three years takes up the theory of all the practical problems the men meet in their every-day work.

25 Per Cent Rate Increase Sought at Everett, Wash

The announcement that the Puget Sound Gas Company is seeking an increase in rates in Everett has been made and means, if granted, an increase of about 25 per cent over present prices.

The action of the Everett company follows that of Seattle, Tacoma and other cities.

"The price of everything used in the manufacture of gas," said Manager Coffy recently, "tends upward. Under our former contract for oil we paid 90 cents a gallon for it. The contract ran out June 1, at which time we were only able to make a new contract until the last of December, and that at $1.50 a gallon. After that we will have to pay $2 a gallon, or an increase of 120 per cent.

"Coke went from $5.25 to $8 in one jump. Slabs increased from 10 per cent to 50 per cent, depending on the nature of the work.

"What we are asking in the way of an increase in the price of gas is not sufficient to equalize what we are paying in increased costs. The company is willing to stand part, and is simply asking the public to stand the balance.

Illinois Company Asks for Suspension of Standards During War

The Public Service Company of Northern Illinois on Nov. 26 petitioned the public utilities commission for a suspension of gas and electric service standards during the period of war. High cost fuels and other extraordinary conditions, involving greater production costs, were cited as the reasons for the request. The municipalities north and west of Chicago served with gas by petitioner are already organized for a protest against the request.

Big Rapids, Mich., to Furnish Toluol

The Big Rapids (Mich.) Gas Company has made a contract with the Government to furnish toluol from its plant. The contract was made by Manager Schacklette on a trip to Detroit.

Many of the large gas plants are putting in special equipment for extracting and purifying toluol.

The amount of toluol which can be obtained at Big Rapids is too small to warrant the installation of special equipment. What is secured will be in crude form.

Taxes Paid by Revere Company Largest in History

This year's tax paid by the suburban Gas & Electric Company, of Revere, Mass., went "over the top" —it was the largest in the history of the company.

The check was handed to City Collector Prendergast by Colin F. Chisholm, general manager of the company, and called for $20,617.20, an increase of $1,112.05, last year's taxes being $19,505.15.

Chicago Fuel Situation Relieved

Advices received at Chicago from Washington indicate that formal cancellation, effective Nov. 30, of the order giving preference to shipment of coal via the Great Lakes to the Northwest will relieve the coal and coke situation which has threatened to compel the Peoples Gas Light & Coke Company, of Chicago, to shut down its plant.

In announcing cancellation of the priority order which has been in effect since Aug. 20, Fuel Administrator Garfield said that after Dec. 1 enough coal will be diverted to Indianapolis, where it will be converted into coke, to relieve the Chicago situation.

"Enough coal will be available for coking purposes in time to meet the demands of the Peoples Gas Light & Coke Company, of Chicago," Dr. Garfield said. "I think I can safely say that the threatened shortage of proper fuel for Chicago gas will not need to cause worry now that the lakes priority order is cancelled."

The fuel situation has been considered so serious by the Peoples company that it has had personal representatives in Washington, and in the various coal fields and coke plants upon which it is dependent, practically continuously during the last few months.

East Ohio Company Increases Wages

To meet the increased cost of living, all employees of the East Ohio Gas Company, of Cleveland, who are receiving less than $3,000 per year have had their wages increased.

Municipally Owned Plants Must Have Increased Rates as Well as Privately Owned Plants

Municipally owned utilities are not exempt from asking higher rates because of increased expense of operation. In this respect, observers declare, they are in no wise different from privately owned enterprises.

Judge Joshua Greenwood, president of the public utilities commission, recently returned from Price, Utah, where he had gone to investigate the petition of the municipal light plant there to increase its rates 20 per cent. The investigation inclined Judge Greenwood to believe that the raise was justified, since affairs of the present administrators of the business appeared to be in excellent shape. The plant, he found, was operated by coal as a motive power, and, although Price was located in the coal-mining district, the cost of fuel had advanced greatly.

Denver Starts Accident Prevention Scheme

An accident prevention scheme in the nature of a competition has recently been instituted by the Denver Gas & Electric Light Company in the hope of reducing the number of accidents at its plants and thus keeping the Denver organization working at full war-time efficiency. The action taken by the Denver company is one of the first results of a circular letter recently sent to all properties by R. G. Griswold, chief technologist of the Doherty Organization, urging them to take every measure to prevent illness and injury at this time, when every bit of labor is essential to efficient operation.

In bringing this matter to the attention of the property managers, Mr. Griswold said, in part:

"We earnestly urge that you and your organization take particular care of your health. Our organization has found it necessary to put part of its reserves in the front line trenches. . . . This means additional work for us to-day. . . . Our reserves must consist of the overload capacity of the individuals. In order to have this overload capacity available, we must take care that each one of us is in first-class condition. Some of the means that suggest themselves are:

"Keep close watch on your weight.

"Take particular care not to catch cold, etc.

"Take early and whole-hearted steps to stamp out any disease before it becomes chronic or develops into something worse. Don't run any chances.

"If you have a weakness toward any particular form of sickness, take double or treble precaution in that direction.

"A periodical or 'routine' medical examination is not a bad investment.

"Always remember that something may happen to some member of your organization, or that some unusual demand may be made upon it which you will have to take up among the remaining members. To do this requires a little reserve capacity in each individual. We realize that sometimes we must all work day and night, but the most and best work is accomplished in the long run by a regular amount of sleep and a little play, even if the work has to be done in the remaining time by the most intense application. . . ."

The Denver company has prefaced its announcement of the accident prevention program with these words: "You men, who are producing heat, light and power for Denver and for the Denver industries making war supplies, are performing a necessary service for your country. Every day that you are absent from work means loss for you, for the company and for the United States."

Thirteen departments are included in the accident prevention competition. Each department has a handicap so as to correct for more favorable conditions in other lines of work, thus all departments are placed upon an equal footing in the contest. The contest began on Nov. 8 and will continue until May 1, 1918. On that date, the department standing first, by having the fewest number of accidents, will receive a silver trophy cup from W. J. Barker, general manager of the company. The cup will be awarded every six months, and the department winning the trophy three times in succession will keep the cup. A cash prize of $100 will be given every six months to the foreman of the winning department.

One of the novelties of the contest is that the score of the respective departments will not be based upon the number of accidents, but upon the loss of time resulting from the accidents.

Investigation Reveals Value of Beaver Dam Plant

The Wisconsin Rate Commission has placed a valuation of $88,789 on the plant and equipment of the Beaver Dam Fuel & Light Company. Last September the company petitioned the commission asking for an increase in their present charges of gas to consumers. It was stated in the company's petition that owing to the vastly increased cost of manufacturing gas an increase was necessary. The advance in the price of coal and oils, together with a higher labor cost, made necessary an increase in the charge to the consumer.

A hearing was held on the matter at Madison in September. The fixing of a valuation on the plant is done by the commission in order that it may have something to base a just and reasonable rate upon. All of the interested parties have been served with a copy of the commission's order fixing the valuation, which is done as of the first of October, and objections to the same will be heard by the commission before a rate is established.

The reproduction value of the plant is placed at $101,792, which, less a depreciation charge of $13,003, makes the present valuation $88,789.

The various items considered in determining the valuation of the plant, together with the valuation of each item, follow:

	Reproduction cost	Reproduction Cost Less Dep.
Land	$2,250	$2,250
Transmission and distribution	50,863	43,644
Buildings and miscellaneous structures	4,055	3,668
Plant equipment	23,810	20,683
General equipment	1,737	1,411
Total	$82,715	$71,656
*Add 15% (see note)	12,407	10,748
Total	$95,122	$82,404
Materials and supplies	2,625	2,625
Total	$97,747	$85,029
Non-operating property	4,045	3,760
Total	$101,792	$88,789

*Note—The addition of 15% to cover cost of engineering, superintendance, interest during construction, contingencies, etc.

Increase Hearings for Three More Illinois Companies

Three petitions asking for increased rates filed by Illinois gas companies were heard by Commissioner Shaw of the Public Utilities Commission of Illinois at Springfield last week, and a decision in each case is expected soon.

The petitions of the Southern Illinois Light & Power Company and of the Cairo City Gas Company were heard Tuesday, Dec. 4, and the petition of the Union Gas & Electric Company, of Bloomington and Normal, Ill., respectively, on Friday, Dec. 7.

Massachusetts Gas Companies Report Shows Increase of 33.87 Per Cent

Combined net earnings available for dividends of subsidiary companies of Massachusetts Gas Companies for October were $463,994, an increase of $157,158, or 33.87 per cent, compared with the corresponding month a year ago.

October earnings compare:

Gas Department:	1917	1916	1915
Boston	$106,500	$131,834	$106,144
East Boston	4,449	7,612	5,581
Quincy	4,296	4,718	3,613
Newton	10,648	11,780	11,344
Total	$125,894	$155,946	$126,683
Coal Department:			
New England Gas	.....	66,998	38,058
New England Coal & Coke	8,506	49,013	37,905
Federal Tow Boat	.....	36,601	5,866
Boston Tow Boat	.....	*1,723	3,836
New England Fuel & Transportation	329,593	.....	.....
Total	$338,099	$150,889	$85,667
Grand Total	463,994	306,835	212,350

Increases in gas output compare as follows (in per cent):

	—October—			—4 Months—		
	1917	1916	1915	1917	1916	1915
Boston	8.83	8.43	†4.42	9.64	7.32	†3.81
East Boston	8.15	10.45	1.24	9.57	11.85	2.83
Quincy	15.49	24.09	13.35	16.22	19.03	14.54
Newton	12.22	16.85	2.01	12.80	15.68	3.59

Net earnings for four months ended October 31 compare as follows:

Gas Department:	1917	1916	1915
Boston	$386,943	$411,922	$354,979
East Boston	19,984	19,666	22,804
Quincy	26,184	19,761	20,934
Newton	28,072	28,740	26,881
Total	$461,184	$480,090	$425,599

Personal Notes

FRANCIS MURDOCK, a former director of the Newton (Mass.) & Watertown Gas Light Company, died Nov. 30, at the age of eighty-one years. He was a prominent citizen in Newton, being president of the Newton National Bank, a director of the Newton Trust Company and a member of the Hunnewell Club. He was also interested in the work of the Y. M. C. A.

THE WESTERN STATES GAS & ELECTRIC COMPANY OF CALIFORNIA, a subsidiary of the Standard Gas & Electric Company, at its recent annual meeting the officers were re-elected.

E. G. JONES, who has been superintendent of the Warsaw (Ind.) Gas Company for the past eighteen months, has been appointed superintendent of the Goshen (Ind.) Gas Company, and in the future will handle both of the above mentioned properties.

F. S. DEWEY was appointed general maanger of the Muscatine (Iowa) Lighting Company on Nov. 1. He was formerly with the company as general superintendent.

EARL W. JAMES, formerly assistant advertising manager of the Welsbach Company, Gloucester, N. J., has become advertising manager of the Bateman Manufacturing Company, at Grenloch, N. J.

THE MILLER, PREWITT, GOFF LAND, OIL & GAS COMPANY, with a capital stock of $200,000, recently filed articles of incorporation under the laws of Delaware. The following officers have been elected: M. S. Miller, Winchester, president; Dan Prewitt, Montgomery County, vice-president; John M. Hodgkin, Winchester, secretary and treasurer. The directors are: M. S. Miller, Mrs. Susan M. Bush, Mrs. J. M. Hodgkin, Dan Prewitt, Ed Prewitt and Cas P. Goff. This company owns 4,000 acres of land in Powell, Estill, Lee and Wolfe Counties, on which there are at present twelve producing wells, six of which are being pumped with an average production of 1,500 barrels a day.

NORMAN S. BURCOMBE, for the past ten years manager of the North Pacific Public Service Company, of Aberdeen, Wash., which operates gas plants in Aberdeen and Hoquiam, has resigned that position and will shortly move to Tacoma to engage in business for himself.

DAVID EGAN FLEMING, eighty-four years old, of 241 Ryerson Street, Brooklyn, N. Y., formerly superintendent of the Nassau Gas Company's works on Kent Avenue, died in the Cumberland Street Hospital from injuries received three weeks ago, when he was struck by an automobile. He was a member of Tyrian Lodge, No. 618, F. and A. M.

JOHN C. MILLER, employed by the Ohio Cities Gas Company in the capacity of engineer and geologist for the West Virginia district, recently visited the College of Mines and Metallurgy, where he was a student a year ago. Under his supervision are 200,000 acres in West Virginia, Tennessee and Kentucky.